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Aboriginal Nutrition and the Nyirrangulung Health Strategy in Jawoyn Country

J. Taylor and N. Westbury

CAEPR
RESEARCH
MONOGRAPH
NO. 19

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Centre for Aboriginal Economic Policy Research
The Australian National University, Canberra

Research Monograph No. 19
2000

First published in Australia 2000.

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National Library of Australia.
Cataloguing-in-publication entry.

Aboriginal nutrition and the Nyirranggulung health strategy in Jawoyn country

Includes bibliography
ISBN 0 7315 5103 6

1. Health planning – Northern Territory – Katherine Region. 2. Aborigines, Australian – Northern Territory – Katherine Region – Nutrition. 3. Aborigines, Australian – Health and hygiene – Northern Territory – Katherine Region. I. Taylor, John, 1953– . II. Westbury, N. III. Australian National University. Centre for Aboriginal Economic Policy Research. IV. Nyirranggulung Health Authority. (Series: CAEPR Research monograph (Australian National University. Centre for Aboriginal Economic Policy Research); no. 19).

363.80899915

Design and layout by Green Words & Images, Canberra
Printed by National Capital Printing

Foreword

Jawoyn traditional owners have responded to the problem of continuing poor health outcomes among Aboriginal people living in the Katherine region of the Northern Territory by engaging in a process of Nyirranggulong, or 'One Mob All Together'. This process aims to return responsibility for coordinating and delivering primary health care in the Katherine East region to the Jawoyn.

The establishment of the Nyirranggulong Health Authority (operating under the auspices of the Jawoyn Association) provides a focus for this strategy. Through the Authority key areas of social and economic life will be integrated into a regional service delivery structure that emphasises their 'interrelatedness'.

One important component of the Nyirranggulong Health Authority's strategy is a partnership between the Fred Hollows Foundation and the Jawoyn Association. As an extension of its ongoing work in the area of Indigenous eye health, the Fred Hollows Foundation is working with the Jawoyn Association on the development and implementation of a project which seeks to improve nutrition in the region's Aboriginal communities.

The first initiative of this partnership was to identify the various elements which currently impede better nutrition in the Katherine East communities, and to examine the current capacity to evaluate the health impacts of any interventionist activities.

The Centre for Aboriginal Economic Policy Research (CAEPR) at the Australian National University was commissioned to respond to this need. Its specific tasks were to examine and discuss:

- the capacity to establish key health indicators for the Jawoyn and the means by which these indicators may be measured over time;
- * the key structural impediments to the provision of better nutrition, particularly in relation to community stores;
- * the structure and delivery of services to the Jawoyn people and other Aboriginal people residing on Jawoyn land; and
- * practical opportunities to address the structural impediments, including policy initiatives.

This report, *Aboriginal Nutrition and the Nyirranggulong Health Strategy in Jawoyn Country*, outlines the work of the CAEPR research team. It seeks to make sense of research on nutrition interventions, to verify the situation in Katherine East, and to examine ways to develop a wide-ranging and sustainable health strategy in that region. The findings of this report contributed greatly to the development of the objectives, protocols, and initiatives of The Nyirranggulong Health Authority's nutrition strategy.

We are pleased to acknowledge that this strategy was formally adopted at the signing of the Heads of Agreement between the Jawoyn Association and The Fred Hollows Foundation in Darwin on 2 May 2000.

Professor Jon Altman
CAEPR

Robert Lee
Jawoyn Association

Ray Martin
The Fred Hollows Foundation

October 2000

Acknowledgments

The authors are greatly indebted to numerous individuals who variously provided information, statistical data, advice, and insights that were essential to the compilation of this report. In random order, these included:

Robert Lee, Irene Fisher and Chips Mackinolty (Jawoyn Association, Katherine)

Olga Havnen, Darryl Cronin, Mike Lynskey, Ray Martin and David Morris (The Fred Hollows Foundation, Darwin and Sydney)

Beverly Sibthorpe (National Centre for Epidemiology and Population Health, Australian National University, Canberra)

Bruce Peel, Jim Wauchope, and Norelle Cleary (Queensland Department of Aboriginal and Torres Strait Islander Policy Development, Brisbane)

Louise Broomhead (Commonwealth Department of Health and Aged Care, Canberra)

Michael Bouchier (Australian Bureau of Statistics, Darwin)

Peter Wordsworth and Charlie Bauman (Barunga Community Health Centre)

Laurie and Betty Hughes (Barunga and Wugularr Stores)

Phil Richards (Barunga–Manyallaluk Community Government Council)

Amanda Hart and Karen Myers (Centrelink, Katherine)

Nic Di Candelo (Manyallaluk Store)

Marianne Galawonga and Mavis Jumbiri (Manyallaluk Women’s Centre)

Joanne Berry (Manyallaluk Clinic)

Megan Wingrave, Kelly Monaghan, Bruce Dunn, Gloria Baillie, Moira Stronach, Didi Devanesen, Vivien Hobson, Pam Gollow, Steve Guthridge, and Paul Quinlan (Territory Health Services, Darwin and Katherine)

Graham Franklin (Northern Territory Department of Local Government, Darwin)

Barabara Bradshaw and Susan Gilmore (Traditional Credit Union, Darwin)

Veronica Birrell (Wugularr Women’s Centre)

Jenny Crawley and Jenny Kennedy (Wugularr Community Health Centre)

Mike Pople and Jane Runyu (Wugularr Community Government Council)

Marion Scrymgour (Katherine West Health Board, Katherine)

Helen Evans (Office of Aboriginal and Torres Strait Islander Health, Department of Health and Family Services).

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Abbreviations and acronyms

ABS	Australian Bureau of Statistics
AGPS	Australian Government Publishing Service
AIAS	Australian Institute of Aboriginal Studies (now AIATSIS)
ALPA	Arnhem Land Progress Association
ANU	The Australian National University
ASGC	Australian Standard Geographical Classification
ATSIC	Aboriginal and Torres Strait Islander Commission
AWS	Anangu Winkiku Stores
BPA	Beswick Progress Association
CAEPR	Centre for Aboriginal Economic Policy Research, ANU
CCT	Coordinated Care Trial
CCTIS	Coordinated Care Trial Information System
CDEP	Community Development Employment Project(s)
CGA	Community Government Area
CGC	Community Government Council
CHINS	Community Housing and Infrastructure Needs Survey
CIAS	Community Information Access System
DATSIPD	Department of Aboriginal and Torres Strait Islander Policy Development (Queensland)
GST	Goods and Services Tax
HIPP	Housing Infrastructure Priority Projects
IA	Indigenous Area
IHANT	Indigenous Housing Authority of the Northern Territory
ICD9	International Classification of Diseases, 9th revision
KWHB	Katherine West Remote Health Board Aboriginal Corporation
MBS	Medical Benefit Scheme
NAHS	National Aboriginal Health Strategy

NARU	North Australia Research Unit, ANU
NATSINSAP	National Aboriginal and Torres Strait Islander Nutrition Strategy Action Plan
NATSIS	National Aboriginal and Torres Strait Islander Survey
NPHNS	National Public Health Nutrition Strategy
NT	Northern Territory
PBS	Pharmaceutical Benefit Scheme
RDI	Recommended Dietary Intake
RHIS	Rural Health Information System
SIGNAL	Strategic Inter-Governmental Nutrition Alliance
SLA	Statistical Local Area
TCU	Traditional Credit Union
THS	Territory Health Services (NT)
WHO	World Health Organisation

1. Introduction

The Jawoyn Association is a body corporate representing the interests of Jawoyn and other people who have interests in and associations with Jawoyn country in the Katherine region of the Northern Territory. The key role of the Association lies in representing and advancing the views and aspirations of Jawoyn traditional Aboriginal owners of land in relation to the management, protection, control, and development of Jawoyn traditional lands. One of its objectives is to provide for the general social welfare of Jawoyn clans.

Discussions on this matter have developed to the stage where a series of administrative agreements with the Commonwealth and Northern Territory governments are being contemplated, with the aim of integrating regional service delivery arrangements for Jawoyn and other residents on Jawoyn land. The organisational umbrella under which these plans are locally articulated is referred to as 'Nyirranggulung' or 'One Mob All Together'. Ultimately, the aim is to place key areas of social and economic life that are currently managed by discrete government instrumentalities back under the control and direction of the Jawoyn, and into an organisational framework that emphasises their interrelatedness.

Jawoyn traditional owners have expressed concern about the continuing poor health outcomes for Jawoyn and other Aboriginal people living in the Katherine region. Recent application to the Commonwealth by the Jawoyn Association for the establishment of a coordinated health care trial in the Katherine East region is driven by a recognition that improvements in health outcomes are achieved only by addressing inadequacies simultaneously across a range of fronts. Thus, for the Jawoyn, improvements in health status are intrinsically linked to issues such as land management, enterprise development, employment, training, housing design, construction and maintenance, education, sport, recreation, law and order, drug and alcohol abuse, and last but not least, nutrition.

Conceptually, Jawoyn thinking about health-related matters is congruent with a discourse among public health professionals that stresses the contribution of social justice, social action, power, and access to resources as key components of Aboriginal health outcomes. This discourse is related in turn to a holistic notion of public health described by social scientists as involving a collective effort in pursuit of socially and economically productive lifestyles (Reid and Lupton 1991: xii). Such an analysis sees Aboriginal health outcomes as being closely bound to notions of community development (Torzillo and Kerr 1991: 326–7). To say that a more holistic approach to health policy is required is almost to state a truism: this notion forms part of the preamble to the constitution of the World Health Organisation (WHO) (Brady et al. 1997: 272). However a much greater focus on addressing the social and economic precedents of ill health is required if this stated intent is to have any real meaning. Health professionals and representatives of the Jawoyn people alike recognise that a reduction in mortality differentials can only be achieved through a real commitment at all levels to focusing on fundamental structural change. The aim is to reduce Aboriginal poverty and dependence within the context of a coherent, comprehensive, and strategic Aboriginal health program (Anderson 1994; Hoy et al. 1997).

The Nyirranggulong process in Katherine East raises issues of research interest on two main counts. First, it attempts to address the nature of linkages between various facets of social and economic life within the Aboriginal domain of the Katherine region, and the possible connections between these and health outcomes. Second, the Nyirranggulong Health Strategy is a hybrid of the model of administrative restructuring that has recently emerged within primary health service delivery under the general banner of Coordinated Care Trials (CCTs). Thus, it provides a case study of interest to analysts of public policy. The common point of entry into these issues is a focus on nutrition or, more specifically, on an examination of the underlying structural social and economic factors that continue to impede progress to improved nutritional status in the communities of the Katherine East region.

Nyirranggulong and nutrition

It has long been recognised that poor diet and nutritional status are strongly associated (along with other risk factors) with a variety of chronic, preventable, and non-communicable diseases that are highly prevalent in Aboriginal communities. Primary among these are cardiovascular disease and diabetes, but malnutrition also forms part of the general complex of reduced resistance to infectious and other disease and may engender its own morbidity profile, manifesting in osteoporosis, dental caries, gallbladder disease, nutritional anaemias, digestive tract disorders, and diet-related cancers. Nutritional disorders are relatively high among Aboriginal people. One recent study, for example, estimates that as many as 20 per cent of Aboriginal children in the Top End of the Northern Territory are malnourished (Ruben and Walker 1995). Not surprisingly, public health programs, especially those targeted at improving health outcomes among Aboriginal people, increasingly identify improved nutrition as an essential intervention (Commonwealth of Australia 2000: 81–8).

Public health interest in the relationship between diet and ill health has developed to the stage of a draft National Public Health Nutrition Strategy (NPHNS) for the period 2000–10. This seeks to build on the 1992 Food and Nutrition Policy and incorporates a National Aboriginal and Torres Strait Islander Nutrition Strategy Action Plan (NATSINSAP). In the context of the Nyirranggulong Health Strategy, certain of the underlying aims of this strategy are of interest, including the high priority afforded to matters affecting access to a nutritious diet by disadvantaged Australians; additional support to the food supply system to improve the nutritional quality of food available; the establishment of partnerships between government, industry and the community; and an intent to establish beneficial impacts throughout the food and nutrition system.

The NPHNS contributes to the National Health Priority Areas initiative (the framework for systematically addressing the national burden of disease) by focusing on a range of interventions under the general heading of ‘non-communicable disease control’. Management of the NPHNS is channelled through the Strategic Inter-Governmental Nutrition Alliance under the National Public Health Partnership which reports to the Australian Health Minister’s Advisory Council. Of particular interest within this framework is the NATSINSAP, which is being developed under the direction of the

Aboriginal and Torres Strait Islander Nutrition Working Party as part of the NPHNS. The NATSINSAP is focused on a number of initiatives which are considered to be essential components of an integrated approach to improving Aboriginal and Torres Strait Islander nutrition. These include efforts to:

- ensure access to healthy foods at all times, at affordable cost;
- build and sustain an Aboriginal and Torres Strait Islander nutrition workforce;
- establish and broadcast 'good practice' for public health nutrition activities in communities;
- encourage family-focused initiatives in food and nutrition;
- establish a national nutrition information system which can be accessed, updated and used by the Aboriginal and Torres Strait Islander workforce and community; and
- establish links between household and community infrastructure and improved nutrition outcomes.

So it is with the Nyirranggulong Health Strategy, which lays emphasis on links between improved nutrition and a range of associated initiatives including viable store management, training of Aboriginal staff, the development of food policies, nutrition education in schools, coordination of nutrition interventions between stores, clinics and community groups, coordination with sports and recreation programs, and revitalisation of hunting and gathering. Certainly, the findings from assessment of interventions that have been in place for some time indicate that a focus on nutritional factors alone, such as changing dietary intake, are a necessary but not sufficient means to achieving intended outcomes (McDermott et al. 2000).

In parallel to the Nyirranggulong process, the Fred Hollows Foundation has sought to broaden its objectives beyond its long-standing focus on eye health to assist in developing sustainable local capacity among Aboriginal organisations and to act as a catalyst for the improvement of health more generally among Aboriginal people. As an initial foray in pursuit of these goals, the Foundation has entered into partnership with the Jawoyn Association to focus on ways of developing the nutrition project component of the Nyirranggulong Health Strategy. The first practical initiative by the partnership was to commission the Centre for Aboriginal Economic Policy Research (CAEPR) at the Australian National University to research, as a 'scoping exercise', the various structural elements that currently impede better nutrition in the Katherine East communities and to examine the current capacity to measure and monitor any health impacts that might arise as the result of intervention. The specific terms of reference for this task were to examine and discuss:

- the capacity to establish key health and social indicators for the Jawoyn and the means by which these may be measured over time;
- the key structural impediments to the provision of better nutrition, particularly in relation to community stores; and the structure and delivery of services to the Jawoyn people and other Aboriginal people residing on Jawoyn land;

- possible options to address the structural impediments; and
- the possible policy options that could be adopted.

A framework for the regional food and nutrition system

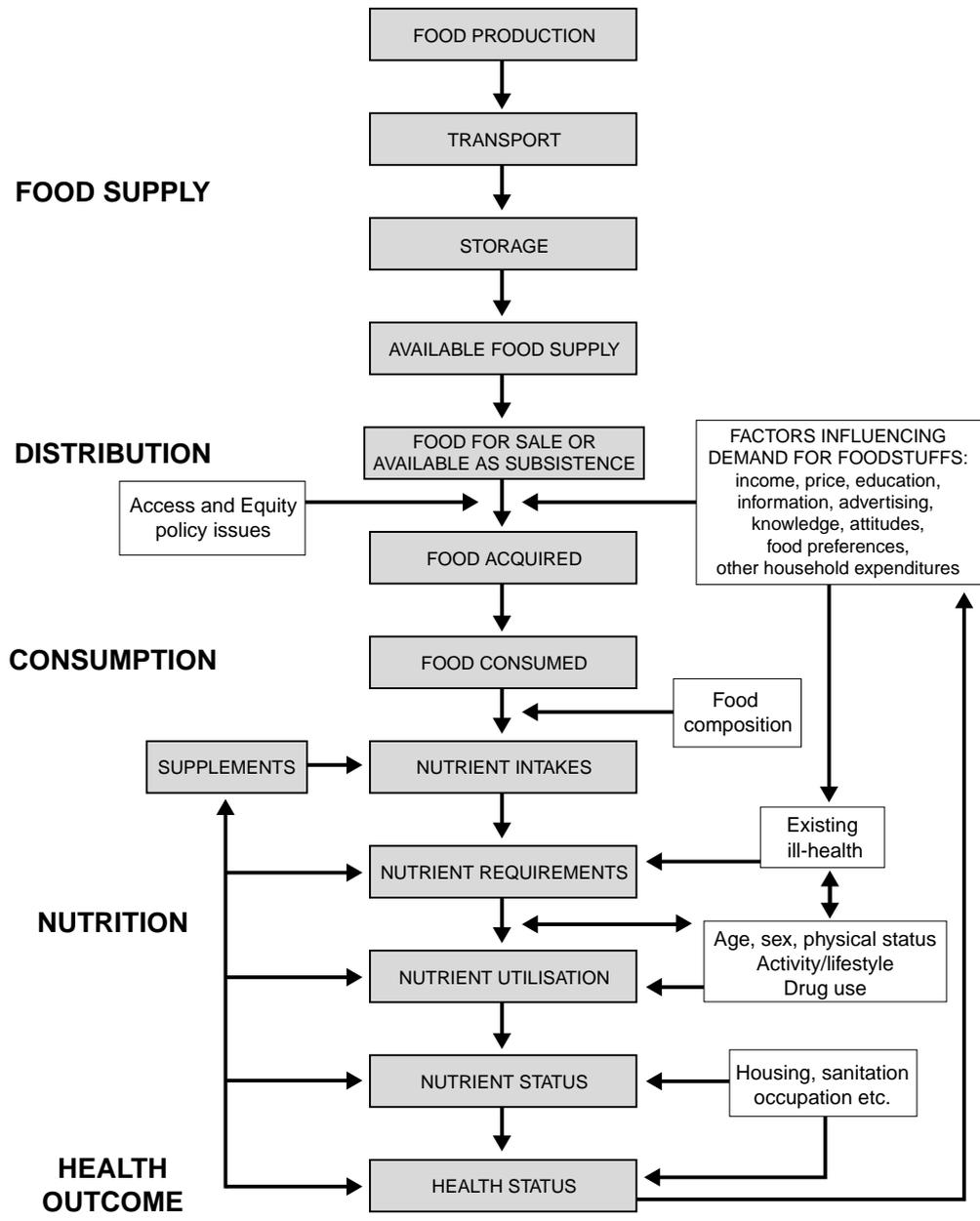
In keeping with the intent of the Nyirranggulung Health Strategy, we have adopted a systems analytical approach to the issue of measuring nutrition and health status and identifying the structural impediments to improved outcomes. In this we follow the lead of the Australian Institute of Health and Welfare and the National Health and Medical Research Council Expert Panel on National Food and Nutrition Monitoring and Surveillance (Lester 1994). This is in line with the approach adopted by the Butlin Report on Food and Nutrition Programs for Aboriginal and Torres Strait Islander people prepared for the Office of Aboriginal and Torres Strait Islander Health (Butlin et al. 1997: 14).

A systems framework provides a way of organising information, assisting in identifying opportunities and strategies for intervention in the food system, and identifying gaps in current knowledge and activity. It also clearly demonstrates the progression from food supply to distribution, consumption and nutrition, and finally to health outcomes, thereby emphasising the linkages between these as well as the possible flow-on effects of action in specific areas and at various points of intervention. For example, if nutritionists seek, through strategic planning, to influence food supply then an understanding of such influences as store management and regional systems of transport and wholesaling becomes important (Butlin et al. 1997: 14). In essence, no component of a strategy to improve health outcomes via better nutrition is independent of a wide variety of connected influences. The conceptual framework employed to illustrate these connections and to serve as a template for analysis is laid out in Fig. 1.1.

Nutrition-related health outcomes are influenced at the outset by the nature of food supply and the factors which affect it. In the Katherine East region, the continuation of subsistence harvesting introduces an important input to the system but one that is difficult to measure. It is safe to say, however, that most foodstuffs consumed in the region are imported (mostly from wholesalers located outside the region) and that their acquisition is determined by arrangements negotiated with community store managers. In this arrangement, distributional issues especially related to transportation (into the region in terms of costs and within the region in terms of transport infrastructure) obviously loom large, but storage capacity (especially for perishable goods) and capacity to handle bulk-packaged items are also important.

Access and equity issues—in essence, the presence or absence of institutional and infrastructural arrangements for the acquisition of foodstuffs in keeping with national norms and standards—also affect food distribution. In Katherine East communities, relevant factors are not only the physical adequacy of store infrastructure but also issues of sound store management, the implementation of food policies, access to electronic banking, and means to financial management. Equity is also crucially related to the relative cost of foodstuffs in different places. Cost, in turn, may be more or less of an access

Fig. 1.1 Conceptual framework for the food and nutrition system in the Katherine East region



Source: Adapted from Lester 1994: 2.

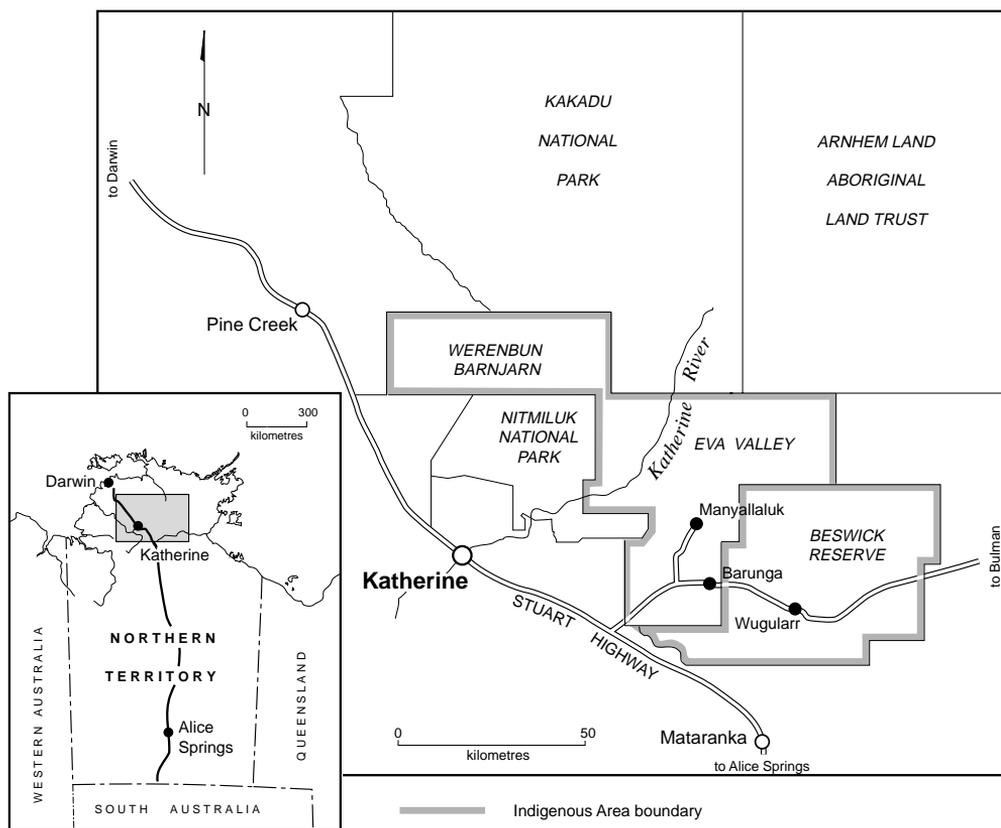
constraint depending on the level of the individual's or household's disposable income. These interactions are illustrated in the centre-right box in Fig. 1.1 which summarises a complex of important social, behavioural, and economic influences on food acquisition and consumption. Once food is consumed, however, the focus of interest shifts from the socioeconomic to the biological realm, although significant interactions between these exist. For example, nutritional requirements, utilisation, and status can be affected by the existing health status of individuals; this in turn has important social, cultural, and economic antecedents (Khoury 1998; Krieger 2000; Mobbs 1991; Syme 1998).

At each step within this analytical schema, the question of data availability arises. If data are either inadequate or unavailable, then some means to redressing this problem would, of necessity, form a routine part of an interventionist nutrition strategy. The possibilities here are well illustrated by the Minjilang Nutrition Project which was able to establish an association between store management and changes in nutritional status through detailed analysis of dietary intake and biochemical measurement among Aboriginal residents of the Minjilang community (Lee, Bailey, et al. 1994; Lee, Bonson, et al. 1995; Lee, Bonson and Powers 1996; Lee, Smith, et al. 1995). Assessing the scope and quality of available data is therefore a primary purpose of the present study. A second, equally important, purpose is to identify, from previous research, evidence-based indications of practical and sustainable interventions that may be applied in the Katherine East context. Much is already known about the direction and nature of linkages within the food and nutrition system; how to intervene successfully to overcome impediments to better nutritional outcomes is less well understood.

2. The Katherine East Aboriginal population

A key issue for public health planning, but one which may be incapable of resolution in this case, is the question of precisely which population should form the target of intervention and monitoring. The straightforward and functional approach to this question is to define the regional population (see Fig. 2.1) as those Aboriginal people counted as resident within the boundaries of the Barunga–Manyallaluk and Wugularr Community Government Council (CGC) Areas. These are the boundaries used for census enumeration and in this context they delineate Indigenous Areas (IAs) within the Australian Standard Geographical Classification (ASGC). They are also the units for which official population estimates are made by the Northern Territory Grants Commission and the Australian Bureau of Statistics (ABS).

Fig. 2.1 The communities of the Katherine East region



Source: Gibson 1999: 13.

However, accurate measurement of the population resident within these boundaries is difficult because of the population's strong social and economic links with individuals and groups located in adjacent and more distant regions. For example, residents of Wugularr have social ties to Bulman and beyond into north-central and north-east Arnhem Land, while people at Barunga are closely connected to Katherine and areas as far north as the Arnhem Land coast and south to the Roper Valley. The consequence is a situation of population flux involving peoples of Jawoyn affiliation but also those of Mayali, Ngalkbon, Rembarrnga and Yolgnu extraction (Ellanna et al. 1988: 210–15; Gibson 1999; Merlan 1998). A more realistic (but operationally difficult) residential model would therefore describe a regional 'pool' of prospective residents in these CGC Areas with a smaller set of actual residents at any one time. Population flux entails that the criteria for including individuals in a statistical profile of the region, or any of its constituent parts, are not always clear. As a result, the databases compiled by the various service providers inevitably use different conceptions and definitions of 'usual residence' in the region.

Population size

In 1996, the total number of people counted by the ABS in Barunga–Manyallaluk and Wugularr on census night was 644. Of these, 93 per cent (597) were Aboriginal people, although a handful of people did not indicate their Aboriginal status. The largest concentration of population was at Wugularr with 273 persons, seven of whom were non-Aboriginal. The other main concentration was at Barunga with a population of 249, of whom 17 were non-Aboriginal. The smallest population was in the balance of the Barunga–Manyallaluk CGC Area where 118 persons were counted. Of these, 105 identified as Aboriginal and the majority would have been located at Manyallaluk.

It should be remembered that these 1996 Census figures represent numbers actually counted in the region on census night. They may, and invariably do, vary from figures derived from administrative sources representing those usually resident in the region. While census-based usual residence figures are not available for these localities, various estimates of the usually resident population of the CGC Areas are available, both from the ABS and from other government agencies and service providers. For example, in 1995 the ABS published a series of experimental population estimates for CGC Areas in the Northern Territory (ABS 1995). These were derived by adding usual residents of each region who were counted elsewhere on census night and then matching subsequent increase to growth in the corresponding Statistical Local Area (SLA). In the case of Barunga–Manyallaluk and Wugularr CGCs, this was the Elsey Balance SLA. Further adjustments were made if data from other sources justified this. Similar estimates are made by the Northern Territory Grants Commission in support of their formula for the allocation of General Purpose Grants. In addition, the Northern Territory (NT) Department of Local Government maintains estimates of Aboriginal population and housing based on information supplied by field officers. This is entered into the Community Information Access System (CIAS) and forms the basis for the assessment of housing and infrastructure needs.

Population figures for each individual locality are also available from the former NT Department of Community Development Aboriginal Communities database of 1986, and from the 1992 and 1999 Aboriginal and Torres Strait Islander Commission (ATSIC) Community Housing and Infrastructure Needs Survey (CHINS) (ATSIC 1993, 2000). Territory Health Services (THS) clinic patient records also provide a source of demographic data. Finally, a North Australia Research Unit (NARU) research team conducted a household population survey of each community in the region in 1987 (Ellanna et al. 1988: 193–218). This includes a list of documented population counts and estimates for each of the Katherine East communities dating back in single years to 1950 (Ellanna et al. 1988: 194).

To provide some sense of recent population levels as well as an indication of the variability in counts and estimates, data from these various sources are presented in Table 2.1 for Barunga, Manyallaluk, and Wugularr as well as for the two CGC Areas, for the period 1986–99.

Table 2.1 Population counts and estimates for Barunga, Manyallaluk, and Wugularr, 1986–99

Location	1986 (a)	1986 (b)	1987 (c)	1991 (d)	1992 (e)	1995 (f)	1996 (g)	1998 (h)	1999 (i)	1999 (j)
Barunga– Manyallaluk CGC Area	426			327		444	371	482		570
Barunga		586	326		360				350	
Manyallaluk		30	22		75				120	100
Wugularr	316	284	163	347	370	459	273	634	650	600
Total region	742	900	511	674	805	903	644	1116	1120	1270

- Sources: (a) Census of Population and Housing 1986;
 (b) NT Department of Community Development Aboriginal Communities database;
 (c) Ellanna et al. 1988;
 (d) Census of Population and Housing 1991;
 (e) ATSIC 1993;
 (f) ABS 1995: 3;
 (g) Census of Population and Housing 1996;
 (h) NT Department of Local Government CIAS;
 (i) ATSIC 2000;
 (j) NT Local Government Grants Commission Annual Report 1998–99.

The striking feature is the large variation in counts and estimates over time and between sources. Reasons for such variation are partly methodological. For example, all the census figures are de facto counts indicating the number of individuals actually recorded as present on census night but excluding any usual residents who may have been elsewhere at the time. By contrast, figures from survey and administrative sources are estimates. That is, they approximate the population considered to be usually resident (for more than 6 months of the year) in each locality. Of particular note is the considerable discrepancy between the 1996 Census count for the region (644) and subsequent estimates of the usually resident population of between 1116 and 1270 made by the Northern Territory Department of Local Government and the 1999 CHINS administered by the ABS.

Some of the variability between census counts and between these counts and estimates of the population may reflect the ineffectiveness of remote area census procedures to enumerate all those present, especially young adults and children (Martin and Taylor 1996). For example, this may account for the substantial decline in the population at Wugularr between the 1991 and 1996 Censuses. At the same time, population mobility can substantially alter the numbers present to be counted at any one time. The population estimates contained in the administrative data are problematic because it is not always clear whether they include all residents, or just Aboriginal residents. Furthermore, they are either desktop estimates or derived using information gleaned from key informants, the basis for which remains unknown. Their reliability is therefore questionable.

The patient records of the THS contain information on community of usual residence for individuals as they engage the health system. Thus, it is possible to draw up a list of all those in the system who indicate one of the Katherine East communities as their usual residence. The list can then be revised by clinic health workers, to delete those known to have deceased, those known to be resident elsewhere, and those born since the list was compiled. At Wugularr, for example, a population of 416 persons was derived in this way for April 1999. Another approach is to limit the listing to those who have accessed the health system within a recent time period, say within the past year (during 1999). This approach yielded a population total of 288 for Barunga and 71 for Manyallaluk which collectively is not dissimilar to the 1996 Census count for the CGC Area.

The difficulty in using administrative data is ultimately one of establishing meaningful cross-sections of the population using data based on population flows. This is where the input from clinic-based Aboriginal health workers becomes crucial. Because health workers are able to update the THS records systematically, the estimates based on THS records are the ones most likely to approximate the true service population (ABS 1996a).

Population mobility

Aggregate population numbers for the region and its constituent parts must be interpreted in the context of high rates of population mobility. The frequent movement of people can substantially alter population levels over time and undermine the clear definition of a 'usually resident' group. Aside from permanent (long-term) movements of individuals in and out of the region, those resident within the region may also frequently be mobile in the short term. As with remote Aboriginal communities generally across Australia, there is a considerable spatial range of movement extending from frequent inter-household shifts within the same community, to intra-regional movement between communities, and longer-range inter-regional movement, often to urban centres such as Katherine and Darwin (Taylor 1998). The spatial extent of this mobility, for each individual, is defined by a mix of social and economic factors ranging from deaths in a community, the location of kinfolk, ceremonial activities, traditional utilisation of land resources, access to education and hospital care, and the need to access other social services, such as those provided by Centrelink.

While frequent population movement is widely acknowledged as a phenomenon, there are no data available on the frequency, extent, and pattern of movement, either within the region or to and from other regions. Some sense of the spatial extent of inter-regional social links is available, largely through ethnographic research associated with land claims processes (Merlan 1998), and while it is readily observable that population levels in each community fluctuate considerably over short periods of time, none of these phenomena are adequately quantified for the purposes of social planning.

Age and sex composition of the population

A basic knowledge of the age and sex structure of the population is vital in establishing rates for social indicators as well as in evaluating health, housing, education, employment, and training needs. The most recent official data on the age and sex of Aboriginal residents of the region are available from the 1996 Census. An alternative source is the date-of-birth information held for each patient in the administrative records of community clinics, but it must be recalled that these data refer only to individuals who have accessed the health system. Thus, any age distribution based on these data is likely to reflect both an age and a gender bias.

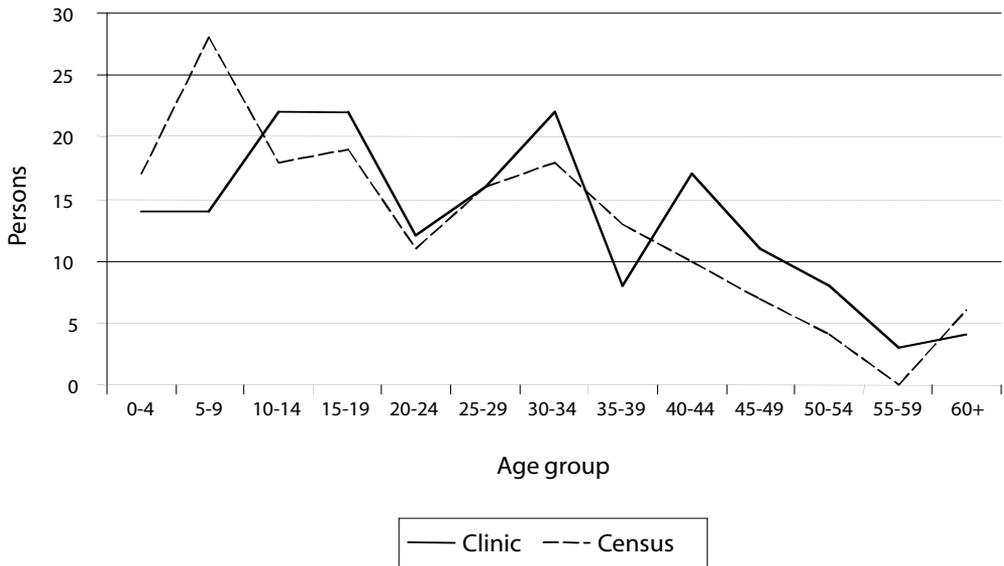
A visual comparison between the census-based and clinic-based age distributions is provided in Fig. 2.2. In considering these, it should be remembered that they refer literally to different populations: the census figures relate to a count of Barunga in August 1996, while the clinic figures refer to those who claimed usual residence in Barunga or Manyallaluk and accessed the health system during 1999.

Despite a broad correspondence, there are marked differences between the distributions at particular ages for both males and females. Among males, the census count is notably higher among children under 10 years but lower for adults over 40 years. Among females, the main difference is in the 15–19 and 30–34 age groups, where the clinic numbers clearly exceed the census count. While these variations make some sense in the context of clinic usage at various ages, their main contribution is to highlight the lack of a consistently defined and measured answer to the question of what constitutes the population of the Katherine East communities. Having said that, the only available demographic data that do have validity (in a statistical sense) are those from the census and these are used here to establish the age and sex composition of the population.

Table 2.2 is compiled from census data. From this source, the age structure of the Aboriginal population counted in Barunga–Manyallaluk appears relatively youthful, with 41.6 per cent of the population under the age of 15 years compared to 35.4 per cent in Wugularr. The latter is closer to the average recorded for the Northern Territory as a whole. In contrast, Wugularr has a higher proportion of adults in the 15–44 age group than either Barunga–Manyallaluk or the Northern Territory as a whole. Both Barunga–Manyallaluk and Wugularr have a somewhat lower proportion of older people compared to the Northern Territory as a whole. Further contrast is evident in the sex ratio. Compared to the Northern Territory ratio of 97 males per 100 females, there are relatively few males in Barunga–Manyallaluk and substantially more in Wugularr. This is surprising given the usually higher mortality rate among adult males.

Fig. 2.2 Comparison of census-based and clinic-based Aboriginal age/sex distributions in Barunga–Manyallaluk: (a) Males; (b) Females

(a) Males



(b) Females



Table 2.2 Distribution of the census-based Aboriginal population by broad age group in Barunga–Manyallaluk and Wugularr, 1996

Age group	Barunga–Manyallaluk		Wugularr		Northern Territory
	No.	%	No.	%	%
0–14	139	41.6	93	35.4	37.6
15–44	162	48.5	142	54.0	49.0
45–64	23	6.9	19	7.2	10.6
65+	10	3.0	9	3.4	2.7
Total	334	100.0	263	100.0	100.0
Sex ratio	90.8		134.8		97.2

Source: Census of Population and Housing 1996.

Dependency ratios

Measures of the potential economic implications of a given age structure are provided by a range of dependency ratios. These are shown in Table 2.3 for the Aboriginal populations of Barunga–Manyallaluk and Wugularr in 1996, with comparison drawn from the Northern Territory as a whole. The childhood dependency ratio is the simplest of these measures: it expresses the number of children in the population (aged 0–14 years) as a ratio of the working age population (aged 15–64). A ratio of 1.0 would indicate that the size of the two age groups is the same—that there is one person of working age for every child. A figure greater than 1.0 indicates more than one child to each person of working age, and a figure less than 1.0 indicates less than one child to each person of working age. This ratio only provides an indication of potential economic providers to dependents since it takes no account of the economically inactive.

Table 2.3 Dependency ratios for the Aboriginal populations of Barunga–Manyallaluk and Wugularr CGC Areas and the Northern Territory, 1996

Dependency ratio	Barunga–Manyallaluk	Wugularr	Northern Territory
Childhood dependency	0.75	0.57	0.64
Childhood burden	1.9	0.86	2.0
Childhood burden (excluding CDEP)	4.8	10.3	3.4
Economic burden	4.1	1.4	3.8

Source: Census of Population and Housing 1996.

In Barunga–Manyallaluk, the childhood dependency ratio was 0.75, which is somewhat higher than in the Northern Territory as a whole (0.64) and much higher than in Wugularr (0.57). Thus, according to census count figures the population at Barunga–Manyallaluk has a relatively youthful character while that at Wugularr has a relatively older, more adult age profile. More refined measures of dependency incorporate some indication of the ability of working-age adults to support others. The childhood burden, for example, is

defined as the ratio of the number of children to the number of employed persons. Once again, a figure of 1.0 indicates parity. According to census data, there were almost two (1.9) children to each employed adult in Barunga–Manyallaluk if all those engaged by the Community Development Employment Projects (CDEP) scheme are considered to be in employment. If, however, this calculation is based on those employed only in non-CDEP work then the ratio is much higher at 4.8. These are substantially above the equivalent ratios for Aboriginal people the Northern Territory as a whole, underlining the relative lack of paid employment in Barunga–Manyallaluk, especially outside of the CDEP scheme. In Wugularr there is even less paid employment, and this is reflected in its ratio of 10.3 children per non-CDEP worker.

Finally, the economic burden is a ratio of the number of children and economically inactive persons (including here those unemployed) to employed persons. In Barunga–Mayallaluk, for each employed Aboriginal person (including those in the CDEP scheme), there are 4.1 other Aboriginal people not employed. However, if those in CDEP are excluded the economic burden rises to 10.5. In Wugularr, there are only 1.4 economically inactive persons to each person employed, although if those on CDEP are counted as unemployed then the ratio rises to 28.1.

3. Socioeconomic characteristics

The Nyirranggulong Health Strategy emphasises full employment as a major health target. Since food is a commodity within the market economy, the capacity of individuals to achieve a balanced and nutritious diet is determined in a very real sense by their economic status as measured by income or purchasing power. In turn, employment in the form of salaried work or self-employment provides the main means of gaining income aside from receipt of social security from the state. A comprehensive nutrition strategy must be based on an understanding of factors controlling the price of food as well as on an indication of income expenditure on non-food items. In turn, it must establish prevailing levels and sources of income and the various means by which individuals currently participate in the labour market.

Barunga and Wugularr, like all remote Aboriginal communities in the Northern Territory, were established primarily as centres for the administration of Aboriginal welfare policies. As such they required no modern economic base, although in the early years of welfare administration they were involved in significant agricultural production (Ellanna et al. 1988). The subsequent experience of such communities in seeking economic sustainability beyond the provisions of the welfare state has been variable, but generally limited. Clearly, community leaders in Katherine East and the Jawoyn Association are development-oriented: they wish to ensure that wider economic opportunities are exploited for the benefit of the local population. To date, such opportunities have occurred within mining and tourism-related developments in the region.

Export generation and import substitution activities provide possibilities for expanding the range of Indigenous employment opportunities in the region. Export activities include mining, pastoralism, tourism, and the manufacture of arts and crafts. The region generally has notable examples of successful Aboriginal participation in ventures such as the Mt Todd mine, Nitmiluk National Park, and the Manyallaluk tourism venture. However, the sustainability of employment opportunities in these volatile market sectors is in question. Import substitution activities embrace a potentially wide range of activities: council administration, housing construction and maintenance, health, education, stores, media, roads, power and water supply, land restoration and management, recreation, and horticulture. Such activities have provided the main basis for employment in the region, but their contribution to sustainability and economic self-management is problematic because of the high degree of dependence on public funding, epitomised by the considerable reliance regionally on the CDEP scheme. This state of affairs prevails in Aboriginal communities throughout the Northern Territory (Taylor and Roach 1998).

Labour force status

Whatever the possibilities for enhancing employment opportunities may be, the issue from the point of view of health planning is to establish the extent to which Aboriginal people in the region currently participate in the labour market. At the end of 1999, the CDEP

scheme was by far the largest employer in the region, with a total of 189 participants. Of these, 129 were registered with the Wugularr scheme and 60 at Manyallaluk. Of the latter, a total of 28 Manyallaluk CDEP positions were allocated to Barunga. As with CDEP schemes generally, the majority of participants (66%) were male. In order to rationalise the allocation of CDEP scheme placements and to benefit from economies of scale, the Wugularr and Barunga–Manyallaluk CGCs are currently exploring the possibility of combining to establish a single region-wide CDEP scheme, with the requirement that all adults resident in the region who are eligible for Newstart Allowance would instead work for the scheme. Beyond CDEP the only other jobs available within the region are through council administration and in the schools and clinics, although the Manyallaluk tourism venture does provide CDEP participants with access to extra hours of work.

While the level and nature of current employment can be established, in the absence of a clearly defined adult population base it is not possible to use current labour force data to determine the rate of employment or unemployment. For this purpose, census data on labour force status must be used. This also allows the situation in the Katherine East communities to be compared with that prevailing in the Northern Territory as a whole.

The distribution of Aboriginal residents of the region by labour force status is shown in Table 3.1, using 1996 Census data. In Table 3.2, these data are converted into rates. Three standard indicators of labour force status are examined:

- the employment rate, representing the percentage of persons aged 15 years and over who indicated in the census that they were in employment during the week prior to enumeration;
- the unemployment rate, expressing those who indicated that they were not in employment but had actively looked for work during the four weeks prior to enumeration as a percentage of those in the labour force (those employed plus those unemployed); and,
- the labour force participation rate, representing persons in the labour force as a percentage of those of working age.

Table 3.1 Aboriginal labour force status in Barunga–Manyallaluk and Wugularr, 1996

Labour force status	Barunga–Manyallaluk	Wugularr	Total
Employed (CDEP)	44	99	143
Employed (other)	29	9	38
Unemployed	63	0	63
Not in labour force	59	62	121
Total aged 15+	195	170	365

Note: Cells in the table have been randomly adjusted to avoid the release of confidential information.
Source: Census of Population and Housing 1996.

Table 3.2 Aboriginal employment, unemployment and labour force participation rates in Barunga–Manyallaluk and Wugularr, 1996

Labour force status	Barunga–Manyallaluk	Wugularr	Total
Employment rate	37.4	63.5	49.6
Unemployment rate	46.3	0.0	25.8
Labour force participation rate	69.7	63.5	66.8

Source: Census of Population and Housing 1996.

The first point to note is that employment in the region is dominated by the CDEP scheme. Out of a total regional employment of 181, only 38 jobs (21%) were independent of the CDEP scheme. Actually, dependence on CDEP was even greater than suggested here since not all those participating in the scheme end up being recorded as employed by the census. Apart from possible under-enumeration, this is because the census question on employment asks only about work in the last week, whereas CDEP work can often be intermittent and is generally part-time only. At the time of the 1996 Census, a total of 64 adults were registered with the Manyallaluk CDEP scheme and 165 in the scheme at Wugularr. This was 60 per cent more than the number recorded by the census as employed in CDEP.

Overall, the official employment rate at Barunga–Mayallaluk was substantially below that for Aboriginal people in the Northern Territory as a whole while the unemployment rate was much higher. In Wugularr, on the other hand, the official employment rate is very high (in fact similar to that recorded for the population generally in Australia), while according to census figures there are no unemployed persons in Wugularr.

Of course, these data require some qualification. For example, in the absence of CDEP the employment to population ratio in Wugularr would be as low as 5.3 per cent, while the unemployment rate would be as high as 92 per cent. A similar effect occurs in Barunga–Manyallaluk: in the absence of CDEP the employment rate falls to 15 per cent and unemployment rises to 79 per cent. It should also be noted that the census recorded only 63 persons as unemployed in the whole region whereas Centrelink data for November 1999 indicate a total of 83 adults at Barunga in receipt of Newstart Allowance, eight at Manyallaluk and 55 at Wugularr. While the gap between census and Centrelink numbers may reflect the impact of changing circumstances, both in labour market conditions and in bureaucratic classification since 1996, it does suggest that the true level of unemployment is somewhat higher than that recorded by the census. Certainly, this is the case if those employed by the CDEP scheme are considered as unemployed on account of their notional link to Newstart Allowance.

Income

Aboriginal people in the region have a number of potential sources of cash income. These range from salaried employment in CDEP or in other more mainstream forms of work, unemployment benefit and other welfare payments from Centrelink, royalty payments, and private income from the sale of art works, crafts and other products. A realistic

assessment of net income status would ideally also consider imputed non-cash income from subsistence activities. However, quantitative data for assessing the significance of such activities in the region simply do not exist at present.

Accurate data on overall levels of income are notoriously difficult to obtain due to a variety of conceptual problems. Census data, for example, are collected for all sources of income in respect of a 'usual week' and then rounded up to annual income. This is often also the case in surveys. The problem is that it is difficult to determine what might constitute 'usual weekly' income in many Aboriginal households. Even if adequate questions were asked regarding income, high levels of population mobility would make it difficult to establish a consistent set of income recipients over a period of time. This is further complicated by job mobility, with individuals often employed on a casual or part-time basis and moving into and out of longer-term jobs. Cash payments from royalties are also made to a proportion of the regional population and this adds further complexity to the pattern of income distribution. As for the circulation of cash between individuals and households, information on this is non-existent at present.

The most comprehensive source of income data for the region based on a consistent methodology is that available from the census. However, the census reports income data in categories with the highest category left open-ended, so that actual incomes have to be derived. In estimating total and mean incomes, the mid-point for each income category is used on the assumption that individuals are evenly distributed around this mid-point.

The gross income reported is intended to include family allowances, pensions, unemployment benefits, student allowances, maintenance, superannuation, wages, salary, dividends, rents received, interest received, business or farm income, and worker's compensation received. Whether all such sources are reported is unknown. One final cautionary note concerns coverage. Because of the limitations presented by census geography, income data are not available for the populations of Barunga and Manyallaluk separately, only for the CGC Area. One distinct advantage of census data, however, is that it provides a means of deriving an estimate of dependence on income from welfare. This is done by cross-tabulating data on income with labour force status as a basis for distinguishing employment income from non-employment income, the latter being a proxy measure of welfare dependence.

Personal income

Personal income distribution based on census data for adult residents of Barunga, Manyallaluk and Wugularr is shown in Table 3.3 by census income category. It needs to be emphasised that these data refer to gross income only and do not adequately reflect the disposable income or value of assets of individuals. This is a crucial issue in determining true economic status, but unfortunately one which is poorly informed by available data. To take just one example, housing and associated costs generally comprise a major expense in individual and household budgets in Australia. In these communities, however, subsidised arrangements exist to offset these costs. It is impossible to fully establish disposable income without a detailed individual or household survey of income and expenditure.

Nevertheless, the income levels reported in the census leave little doubt as to the high degree of poverty in the region. Census data indicate very low median incomes for Aboriginal people in the region (Wugularr \$6552 and Barunga–Manyallaluk \$9204). In terms of income distribution, only nine Aboriginal adults have individual incomes in the range close to the median for non-Aboriginal adults in the Northern Territory (\$24,128). Many more (188) have incomes that are lower than the already low median of around \$8000 reported for these communities. For a further sense of relativities, it is useful to place these results in the wider regional context of the Garrak–Jarru ATSI Regional Council area, where the median annual income for Aboriginal males in 1996 was \$8632, while for females it was \$8944.

Table 3.3 Distribution of individual annual gross income: Aboriginal adults in Barunga, Manyallaluk, and Wugularr, 1996

Income category	No.	%
Nil income	43	12.1
\$1–6239	69	19.4
\$6240–\$10,399	188	52.8
\$10,400–\$20,799	47	13.2
\$20,800–\$31,199	9	2.5
Over \$31,200	0	0.0
Total no. (%)	356	(100.0)

Source: Census of Population and Housing 1996.

From a nutrition perspective, an important consideration in the distribution of income is the relative amount of income available to females as opposed to males: women have been found to be more likely to spend available income on foodstuffs as opposed to other consumer items (Rowse et al. 1994). According to 1996 Census data, the median individual fortnightly income for females (\$356) was essentially the same as for males (\$352). In Wugularr, however, median female income (\$268) was somewhat above that reported for males (\$236). This may reflect the fact that much welfare income in the form of child and family supplements from Centrelink is directed to females.

Family and household income

Whatever the level of personal income, the more important units for assessing income, especially in the context of assessing links to nutritional status, are the family and the household. Collective economic decisions about expenditure and consumption are generally made at those levels. In census terms, a family is defined as two or more persons (one of whom is aged over 15 years) who are related biologically, by marriage (registered or de facto), adoption, step or fostering, and who are usually resident in the same household (dwelling). Visitors to households are excluded from census household figures. In this schema, there are invariably more families than households: the household is defined as a group of two or more related or unrelated people who usually reside in the same dwelling,

who regard themselves as a household and who make common provision for food or other essentials for living. In the material developed by the ABS to assist remote area census collectors, there is the implicit assumption that families can be mapped onto households and, moreover, that family structures are similar to, or in essence variants of, the nuclear family of mainstream society.

From an ethnographic perspective these are highly problematic definitions when applied to Aboriginal households, particularly those in remote communities (Martin and Taylor 1996). While it is useful to confine the notion of a household to residents in a physical dwelling or location, Aboriginal households are typically highly fluid in composition, often with a more or less stable core and a variable periphery of transient residents drawn from the same regional population pool. In such circumstances, it is clear that family groupings and domestic economic units are not necessarily coterminous—for instance, people who live together may not eat together. Commonly too, the basic economic and social units of Aboriginal societies are comprised of linked households rather than single ones (Altman 1987; Finlayson 1991; Finlayson and Auld 1999; Smith 1991, 1992), and what Aboriginal people themselves refer to as ‘families’ are typically dispersed across a number of households. It is such clusters of households, rather than individual households, which commonly form the basic units of consumption in remote Aboriginal communities.

With the above caveats in mind, the 1996 Census identified 62 Aboriginal households in Barunga–Manyallaluk containing 63 families and 15 lone-person households. The corresponding figures in Wugularr were 64 households with 52 families and 15 lone-person households. Given the generally low level of personal income in both localities, dependency on income support from welfare is obviously high. Consequently, there is a real sense in which family and household income levels are related to the size of families and households, because welfare payments are designed to provide a minimum standard of living for all members of a family, not just the recipients of government payments. Unfortunately, this relationship between income and family size cannot be adequately explored using census data because the small number of observations increases the margin of error.

As with personal income, some discrepancy is evident between median family incomes in Barunga–Manyallaluk and Wugularr, with somewhat higher levels in the former (Table 3.4). The median family income of \$22,464 in Barunga–Manyallaluk is notably higher than that reported for Aboriginal people generally in the Garrak–Jarru ATSI Region (\$19,929), while the median family income for Wugularr of \$16,120 is notably lower. These figures are interesting in light of the standard of \$1389 used by THS for representing the fortnightly income of a typical family (of 6) for the purposes of comparing fortnightly food costs as part of reporting the Community Market Basket Surveys. On the basis of census data, this figure would seem to be set way above median family income levels for Katherine East communities. However, evidence from Centrelink suggests that census-based self-reported income is substantially underestimated.

As expected, household incomes are distributed across higher income categories than family incomes, although the median household income in Barunga–Manyallaluk (\$26,936) is only slightly higher than the reported median family income, while that reported for Wugularr (\$16,640) is effectively the same as the family median. This difference between

the two communities has to be interpreted in the light of the knowledge that an average of 5.3 persons were reported in each household in Barunga–Manyallaluk compared to only 4.1 persons per household in Wugularr. Therefore household incomes are likely to have been higher in the former. While comparison of household incomes with ATSI Regional Council data becomes more difficult owing to increased variability in household size and composition, it is interesting to note that the median household income reported for Garrak–Jarru ATSI Region was \$29,557.

Table 3.4 Distribution of annual gross family income: Aboriginal residents of Barunga, Manyallaluk, and Wugularr, 1996

Income	Barunga–Manyallaluk	Wugularr
\$1–10,399	6 (8.8)	12 (21.8)
\$10,400–20,799	25 (36.7)	29 (52.7)
\$20,800–\$41,599	28 (41.1)	14 (25.4)
Over \$41,600	9 (13.2)	0 (0.0)
Total no. (%)	68 (100.0)	55 (100.0)
Median	\$22,464	\$16,120

Source: Census of Population and Housing 1996.

Employment and non-employment (welfare) income

An important question in relation to the nature of the Jawoyn economy concerns the relative contribution made to total income by employment as opposed to other sources: whether net incomes derived from social security payments are similar to those derived from employment (after tax). There is likely to be approximate parity unless earnings from employment are at much higher gross levels before tax, which would necessitate access to well-paying jobs. It is argued generally for Aboriginal people that the gap between welfare and earned income is sufficiently low as to discourage job seeking (Hunter and Daly 1998). A key economic question for future planning of employment in the region is whether this reflects the situation in Katherine East.

It is indeed the case that the few jobs that provide a net income sufficiently in excess of the welfare range are generally occupied by non-Aboriginal workers, mostly by virtue of the occupational skills required. Thus, according to the census, only nine Aboriginal people in the whole region occupied mainstream non-CDEP jobs that provided incomes around or above the Northern Territory median income.

The actual contribution to regional income from employment and non-employment sources is shown in Table 3.5. According to these calculations, almost half of the total annual income in the three communities of \$2.85m is derived from welfare payments (40.8%). However, in this calculation wages from CDEP are considered to be employment income. If, instead, this is treated as welfare income on account of the notional link to Newstart Allowance, then the welfare share of total income rises to 79.7 per cent.

Table 3.5 Distribution of annual income from employment and non-employment sources: Aboriginal residents of Barunga, Manyallaluk, and Wugularr, 1996

Labour force status	Income (\$)	% of total income
Employed (CDEP)	1,111,760	38.9
Employed (Other)	580,840	20.3
Unemployed	476,840	16.8
Not in the labour force	684,320	24.0
Total	2,853,760	100.0

Source: Census of Population and Housing 1996.

This high level of dependency on income from welfare is typical of most remote Aboriginal communities in the Northern Territory, indeed across much of Australia. The significance from a nutritional perspective lies in the fortnightly pattern of income flow that this generates. There is a close association between dietary quantity and quality and 'pay day', leading to a cycle of feast and famine (Beck 1985: 89; Rowse 1988; Westbury 1999). A typical dietary pattern noted in the few studies that have focused on this issue is the intake of a greater variety of foods and increased intake of fruit, vegetables, and meat for three days after 'pay day', with a diet mainly of bread and damper in the 'off-pay' week (Gracey et al. 1999: 157). Not surprisingly, the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) found that around 40 per cent of adults in the Garrak–Jarru ATSIC Regional Council area were worried about acquiring an adequate food supply over the fortnight prior to the survey (ABS 1996b: 23).

Income from Centrelink

The quality of census-reported income data is put in question when the income reported by those unemployed, or not in the labour force, is set against estimates of annual welfare payments derived from Centrelink administrative data. In order to obtain a clearer picture of the composition of welfare income, information was obtained from Centrelink on the number and type of benefit payments to Aboriginal clients in Barunga–Manyallaluk and Wugularr. These reveal that for one fortnight at the end of November 1999 a total of \$61,548 was paid to clients at Barunga, a total of \$10,331 to those at Manyallaluk, and \$46,042 to clients at Wugularr. This amounts to a regional fortnightly total of \$117,921. Assuming this to be constant throughout the year, an annual estimate for welfare payments of \$3,065,920 may be derived. This is 2.6 times greater than the census-based estimate, albeit unadjusted for inflation since 1996.

Tables 3.6, 3.7, and 3.8 show the distribution of payments by type to clients in Barunga, Manyallaluk and Wugularr for a period of one fortnight at the end of November 1999. Equivalent data for Manyallaluk are not available. The first point to note is that the number of family allowance recipients is almost identical to the 1996 Census counts of families for each locality, which suggests that virtually all families in the region are in receipt of family allowance. This is not surprising given that eligibility for these payments is subject to income and asset tests which are set way above the levels of income distribution as described from census data. However, the amount of family allowance payments varies

according to the number and age of dependents, with a minimum rate per child of \$23.70 per fortnight and a maximum of \$128.80. A large family supplement of \$7.80 is also payable for the fourth and each subsequent child.

Table 3.6 Centrelink payments by type of payment and age of client: Aboriginal residents of Barunga, 1999

Age group	Payment type							
	Age	DSP	PPS	PPP	FPA/FTP	NSA	YAL	Other
14-19		1	3	4	7		17	
20-24		2	1	6	7	12	3	1
25-29		2	1	3	5	14		
30-34		1	2	4	9	15		2
35-39		1	1	3	4	9		1
40-44		1	2	1	4	11		
45-49		1		3	3	10		
50-54		1				7		1
55-59	3				1	4		3
60+		1			1	1		
Total	3	11	10	24	41	83	20	5

Key: Age = Age Pension; DSP = Disability Support Pension; PPS = Parenting Payment Single; PPP = Parenting Payment Partnered; FPA/FTP = Family Allowance; NSA = Newstart Allowance; YAL = Youth Allowance; Other = Child Disability Allowance, Wife Pension, Widow Allowance, Carer Pension, Partner Allowance, Family Tax Payment.

Source: Centrelink, Katherine.

Table 3.7 Centrelink payments by type of payment and age of client: Aboriginal residents of Manyallaluk, 1999

Age group	Payment type							
	Age	DSP	PPS	PPP	FPA/FTP	NSA	YAL	Other
14-19			1	1	2		1	
20-24			1	2	3			
25-29			1	2	6			
30-34								2
35-39						1		
40-44						2		
45-49						2		
50-54						1		1
55-59					1			2
60+	2	1			1			
Total	2	1	3	5	13	6	1	5

Key: See key to Table 3.6.

Source: Centrelink, Katherine.

Table 3.8 Centrelink payments by type of payment and age of client: Aboriginal residents of Wugularr, 1999

Age group	Payment type							
	Age	DSP	PPS	PPP	FPA/FTP	NSA	YAL	Other
14–19			2	1	6		1	
20–24		1	1	1	4	5	1	
25–29		1		1	10	9		1
30–34		2	2	2	9	7		
35–39		1	1	1	5	15		1
40–44		2	1	1	3	6		1
45–49			1	2	2			
50–54		1			1	1		1
55–59		1		1	1	1		
60+	12	1	1		2	1		
Total	12	10	9	10	43	45	2	4

Key: See key to Table 3.6.

Source: Centrelink, Katherine.

Not all allowances and pensions are mutually exclusive. For example, it is possible for someone to receive family allowance and parenting payments, while other combinations of payments are also possible depending on individual circumstances. This overlap further complicates the calculation of any regional dollar average or cumulative total. Nonetheless, the range of basic rates that apply to each payment, as well as the criteria for eligibility, do provide some indication of the economic status of recipients.

The data indicate a total of 22 sole parents (all except 3 being female), and 39 families receiving payments as partnered parents. These payments are made to provide financial assistance to low income families with dependent children. Additional assistance is provided to families with only one main source of income, including sole parents, with a dependent child aged under 5 years. It is also meant to provide increased choice for parents in balancing work and family responsibilities. Given the income distribution as described, recipients in the region are likely to be on maximum rates for this payment and in receipt of up to \$361 per fortnight for sole parents and \$293 for partnered parents.

The other major welfare payment (Newstart Allowance) is for unemployed persons, eligible by virtue of being over 21 years old, being registered with Centrelink and in compliance with the terms of an activity test based on proven job search, vocational training, rehabilitation, or some other agreed activity such as voluntary work. This compliance effectively indicates that an individual is actively seeking paid work and is willing to undertake suitable paid work. In the Katherine East region, available work is insufficient to meet the demand from those seeking employment. Thus, the regional total of 81 males and 53 females in receipt of Newstart Allowance indicates a far greater level of unemployment than that recorded by the census. On these figures, the unemployment

rate in Wugularr is certainly much higher than recorded by the census (0), with 55 persons recorded by Centrelink as unemployed even despite the continued availability of CDEP. There may be some confusion here, however, as individuals on CDEP can now also register as unemployed. However, Centrelink records 89 persons as unemployed in Barunga while the census figure is 63, and this provides a fairly clear indication of unemployment levels given the general absence of CDEP in Barunga. Payments for Newstart Allowance amount to \$325 per fortnight for single people with no children, \$352 for single people with children, and \$293 each for partners.

From a Centrelink perspective, disability payments are available for individuals who by virtue of a physical, intellectual or psychiatric impairment are deemed unable to work or to undertake educational or vocational training which would equip them for work. In more humanistic terms, they are people who lack independence in their everyday lives. According to the payments data, it appears that there are relatively few such individuals (13 in Barunga, 12 in Wugularr and 3 in Manyallaluk), although it would be worth checking these numbers against disability data from THS. Whatever the numbers, the crucial factor for disabled community members is whether there are sufficient disability services available. These would include rehabilitation, community and recreational access, respite, meals, home help, independent living and life skills training, personal care assistance, employment support, and education support.

Given the general absence of a mainstream labour market in the Katherine East Region, it is not surprising to find that average incomes fall within the range set for welfare recipients. Consequently, by Northern Territory standards, the vast majority of households probably exist below the poverty line. This observation is deliberately hesitant because information on costs and expenditure are not available: no household survey has been conducted. Also lacking is any sense of sources of income outside of formal employment and Centrelink payments. Examples here would include royalties, earnings from the sale of arts and crafts, and imputed non-cash income from subsistence activities.

4. Food supply

Traditionally, Aboriginal peoples depended on the plant and animal foods yielded by terrestrial and marine environments with food supplies (presumably) adequate to meet nutrition requirements within the context of a stable population. Substantial knowledge of food ecology was a necessary part of this arrangement and systems of ecosystem management were required. By contrast, remote Aboriginal communities today are now almost entirely dependent on imported food supplies. Traditional food sustenance has declined and, according to one estimate from the Top End of the Northern Territory, now provides, on average, only 3–6 per cent of food intake (Lee 1992).

In this contemporary setting, there are several factors that create inequities in the supply of food to remote communities, leading to insecurity of supply and eventual ill health (Hughes 1995; McMillan 1991; Rae 1995). Presently, 90 per cent of foods eaten by Northern Territory residents are from interstate or overseas (Cann 1995). Issues relating to transport therefore play a significant role, impacting on the quantity, quality, cost, and availability of foods in remote communities.

Globalisation of the food supply system

One of the global impacts of urbanisation and the movement of populations to larger towns and cities has been a revolution in the nature of food production and food supply. The effects are felt well beyond the cities and into the most remote communities (Rae 1995). The changes involved have also created a dependence on cash economies and complex transport and communication systems that are generally beyond people's comprehension, let alone their ability to control. The trend has been towards global networks of food trading and marketing, resulting in the creation of giant corporations involved in food manufacture and a concentration of the wholesale food sector. In Australia, for example, 95 per cent of the food wholesaling and retailing market is divided between just four major companies.

Globalisation has also involved the adoption of market research assumptions based primarily on the needs of city consumers, often to the detriment of rural-based consumers. For example, the limited refrigeration capacity of many remote community stores precludes them from taking advantage of special price offers that are based on a presumption that all consumers have access to microwave ovens, refrigerators and freezers. One study of such capacity in remote communities in Northern Australia found that only 49 per cent of households had fridges, 23 per cent had freezers, 57 per cent had electric frying pans and 51 per cent had working stoves (Butlin et al. 1997: 118).

This lack of infrastructure is significant given trends towards larger food package sizes, increases in ready-to-cook and frozen products, and increased varieties of the same product. This form of food presentation, which is responsive to the needs of affluent urban populations, may actually increase the nutritional vulnerability of remote communities thereby posing a challenge to those involved in food and nutrition planning. Links are now being established between the food provided through Aboriginal community stores

and the ill health that results from an unbalanced diet (Butlin et al. 1997: 184; Lee, Bonson, and Powers 1996; Rae 1995).

Global trends are also reflected in local patterns of food consumption. There has been an increase in intake of convenience foods (including take-aways), whose nutrition impacts are manifest in higher dietary intakes of fats and sugars (Hughes 1995). Generally the quality of fresh fruit and vegetables imported into the Northern Territory has been lower than for other States, and the quality of foods delivered to remote communities has been even lower. The cost of living in the Northern Territory is higher than elsewhere in Australia, and thus access to efficient and reliable transportation is even more critical in helping to ensure that adequate and affordable foods are made available in remote Aboriginal community stores.

Most community stores have no control over food transport services, but like other commercial retailers they are able to shop around for the best-priced options. In this exercise, economies of scale, the credit standing of individual stores, and their record of trading reliability are all considerations that may significantly determine the extent of commercial leverage they can apply. Recognising the economic benefits to be gained from larger scale operations, the Arnhem Land Progress Association (ALPA) and Anangu Winkiku Stores (AWS) have integrated their management structures, policies, and guidelines for the supply and transportation of food and the training of store and transport workers in remote community stores. AWS have contracts with a transport company to supply about 20 stores, and charge the same flat rate regardless of whether stores are located 800 or 300 kilometres from Alice Springs.

Important economic consequences of these arrangements are that the larger stores effectively subsidise the smaller stores and that the latter receive weekly deliveries of foodstuffs (Hughes 1995). ALPA also has a contract with a major Territory wholesaler to supply and transport goods for its 12 stores located across Northern Australia. Another example of a collective approach to regional supply is provided by the Queensland Department of Aboriginal and Torres Strait Islander Policy and Development. This administers stores in six remote Indigenous communities in coastal North Queensland and lets all its transport requirements by public tender, apart from barge transport contracts which are let by the community councils themselves.

Present transport arrangements for food supply in the Katherine East region are far more ad hoc than the examples described above, although Barunga and Wugularr stores, which are managed by the same individual, currently share a supply arrangement through Australian Independent Wholesalers based in Darwin. One option raised by this store manager for acquiring local sources of fresh meat products was to utilise the abattoir at Bulman with packaging conducted at Barunga store. However, this could not be achieved without improvements to infrastructure such as refrigerated transport and upgraded food processing areas. At Manyallaluk, where the store is under separate management, supplies are arranged through a variety of sources depending on the commodities involved, reflecting the fact that the foodstuffs available at Manyallaluk are necessarily of a higher quality and variety in order to cater for the large number of tourists who camp at Manyallaluk each year.

Import substitution

The product of subsistence hunting and gathering activities represents a form of import substitution which can have a substantial impact on dietary intake and nutritional status in Aboriginal communities. There is considerable evidence for a significant shift in Aboriginal diet and nutritional status as a consequence of European colonisation and the subsequent sedentarisation of Aboriginal peoples. A key element was the move from consumption of 'slow release type' carbohydrates of traditional diets to the 'fast release type' carbohydrates of contemporary Western diets (Thorburn et al. 1987), and from a low fat, low salt diet to a high fat, high salt diet (Brand et al. 1983; Naughton et al. 1986). The nutritional impact of this shift is well illustrated by the demonstrated effect of temporary reversion to reliance on hunter-gathering, which generally leads to significant weight loss as well as a reduction in biochemical abnormalities and in risk factors for cardiovascular disease and diabetes (O'Dea 1984).

Accordingly, one of the initiatives envisaged under the Nyirranggulong Health Strategy is the revitalisation of ecological knowledge and management, and support for 'bush tucker' hunting and subsistence. However, on its own, 'reverting' to traditional patterns of food intake and physical activity is unlikely to provide a sustainable, practical strategy for the majority of Aboriginal people in the region. The Health Strategy has instituted 'Yernderr' healing camps which are designed to manage health in traditional ways by providing respite periods for people with chronic health problems. They involve a dietary shift to traditional subsistence foods. Despite the role that consumption of traditional foods might play in providing physical exercise and improving dietary intake, there are no rigorous data concerning the extent of current hunting and gathering activities in the region nor of the nutritional yield from any subsistence production. Anecdotal evidence suggests that considerable amounts of hunting and gathering do occur, especially among sections of the population at Wugularr and Manyallaluk.

The various approaches to collecting data on subsistence production and their limitations have been summarised by Altman and Allen (1992). In their view, there are two broad approaches used for collecting data on informal activities—case-studies and surveys. The main issues guiding the choice of approach are verification and accurate assessment of production and consumption. In Australia, the emphasis has been on the case-study approach, reflecting the importance placed on analysing subsistence activities in their full ethnographic and ecological contexts. Successful methods for measuring subsistence activity have therefore generally involved direct participant observation and include time allocation techniques—based either on direct observation or indirect methods—and measurement of output, using either methods that emphasise quantities produced or quantities consumed, again using direct or indirect techniques. This case-study approach is highly labour intensive and requires at least one full year of observation and measurement in order to incorporate seasonal rounds of activity. Even then, continual monitoring would be optimal because of year to year changes in productive yield.

Comprehensive case studies of Aboriginal participation in subsistence activities are very rare. Meehan's (1982) analysis of Burada subsistence activity at Kopanga outstation in

coastal Arnhem Land, and Altman's (1987) research with Gunwinggu people at Momega outstation are the prime examples. Interestingly, both analyses indicate that food production based on hunting, fishing, and gathering can remain of great economic and nutritional significance to Aboriginal groups, even in a context where store-purchased foods are also accessible.

The basic difficulty with the survey method is that acquisition of accurate data is not amenable to interview techniques. For example, in many situations in remote regions there is a strong ideology of high resource utilisation that at times does not match actual rates of exploitation. This can only be verified by checking the accuracy of survey responses. One approach to this is random spot checking (that is, demonstrate what is in the pot) but this requires fairly widespread sampling to be accurate and it is also intrusive, especially if carried out by visiting interviewers. At the household level it is often very difficult to correlate subsistence production with consumption because of widespread and highly variable sharing of perishables. Whether resources are shared largely depends on the extent of household surplus, and opportunities and demands for sharing (for example, expected or unexpected visitation by non-household members). Clearly, any attempt to monitor subsistence activity as part of the Nyirranggulung Health Strategy would need to address these methodological problems.

Other options for increasing locally-generated food supply are available in the form of market gardening and animal husbandry. Historically, missionaries and government welfare agencies organised the operation of market gardens, piggeries, poultry farms, and pastoral enterprises to supplement food supplies in many remote communities. At both Barunga and Wugularr local annual production figures for the 'welfare period' from 1957–69 confirm significant levels of production of meat, fruit and vegetables, and eggs. For example, in 1968–69 Wugularr produced 29,100 lbs of meat and 224 dozen eggs and shared with Barunga a total production of 24,682 lbs of fruit and vegetables. Over the same period Barunga produced 9672 lbs of meat and 300 dozen eggs (Ellanna et al. 1988).

Most of these foodstuffs were distributed to the members of the two communities through government-run kitchens. These forms of local production were abandoned when welfare policies were dismantled in the 1970s and have now largely disappeared from remote Indigenous communities across Northern Australia, although some Indigenous families on outstations maintain community gardens. Discussions with Community Council staff at Barunga and Wugularr confirmed that various attempts have been made in recent years to establish market gardens and orchards, but these proved unsustainable due to factors such as vandalism and lack of community commitment to the projects. The most prominent current proposal involves the potential establishment of a fish farm at Wugularr.

Encouraging local production has been the subject of more recent detailed examination in Torres Strait. A wide range of strategies have been identified, aimed at stimulating community, communal, and family gardens and subsistence food production (Leonard et al. 1994). This thrust is also evident in the Queensland Aboriginal and Torres Strait Islander Food and Nutrition Strategy (Queensland Health 1995) and the Aboriginal Food and Nutrition Policy for Western Australia (Office of Aboriginal Health 1996) which both

identify specific strategies to encourage local production and harvesting of bush foods. The result in Queensland was the Gadin Kai Kai Blo Umi project, located in Torres Strait, which included strategies to boost local production and consumption of fruit and vegetables. This was to occur through the employment of an experienced horticulturist with community development experience to guide and implement the project and train local people over a three-year period. At the time of writing, the outcomes of the project were yet to be reported (Butlin et al. 1997: 78).

The Northern Territory Food and Nutrition Policy for the period 1995–2000 canvassed a range of options to boost locally-based food production, with a specific target of raising local production in remote Indigenous communities by 50 per cent. However, it appears that these strategies have not translated significantly into on-the-ground changes that are acting to reduce reliance on external food supplies. The proposed Northern Territory Nutrition Strategy for 2000–05 includes further reference to this issue through an intent to promote the establishment of community gardens, although again just what steps will be taken to achieve this outcome are not specified.

Store management and infrastructure

Previous and current initiatives to further and sustain improved nutrition in remote Indigenous communities have all identified management issues and the commercial sustainability of community stores as critical components (Butlin et al. 1997: 184, 185; Lee, Bonson, and Powers 1996; McMillan 1991). Ideally, the steps taken in pursuit of improved nutrition would include the following:

- the systemic maintenance of effective commercial management practices, including recruitment practices and independent monitoring of financial and management practices;
- the adoption of nutritious food policies (including promotion and commercial mark-up policies);
- the securing of cost efficient transport for dry and refrigerated foods;
- the introduction of commercially viable 'book-down' and other credit practices;
- the adoption of best practice in the ordering, receiving, handling, and storage of dry goods and fresh produce;
- the provision of culturally informed banking services;
- the implementation of employment and training policies which include defined career paths;
- Indigenous community participation, including supervision of policy;
- the implementation of modern store design, including storage, display and refrigeration; and
- the maintenance of a current business plan.

In the light of these criteria, it is instructive to consider the results of the most recent independent evaluation of the Barunga, Wugularr and Manyallaluk community stores, which occurred in May 1998 (Lewis 1998). This review included an assessment of the operating performances of the stores; existing purchasing practices, procedures and assessment of savings that might be achieved by combining purchasing power; the controls and systems in place, and possible improvements that might be implemented such as in the provisions for book-down and stock control; and any other recommendations on management and ownership.

It is important to note that this evaluation occurred at a time when the Barunga store had recently changed management and that management of the store at Wugularr has also subsequently changed. The results of the review thus reflect the position prior to recent management changes; nevertheless they still reflect the basis upon which current management has had to make decisions.

The trading results for the years ending 31 January 1996 and 31 January 1997 were examined. Barunga store's trading position for the first of these periods showed gross sales of \$1.327m, with gross profit running at 27 per cent. After taking expenses into account this represented a net surplus of \$30,000. The trading position for the year ended 31 January 1997 showed a decline of gross sales to \$942,000 with gross profit dropping to 24 per cent. After wages and other expenses are taken into account this represents a net loss of \$63,000. Figures for the year ended 31 January 1998 were not available. The review concluded, on the basis of these financial data, that the declining gross profits of the store were well below industry levels for community stores and that the Barunga store should be achieving gross profits of about 30 per cent and a consistent surplus of over \$50,000 per year.

At Wugularr the trading position for the year ended 30 June 1996 showed gross sales of \$1.121m, with gross profit running at 15 per cent. After wages and other expenses are taken into account, this represents a net loss of \$32,000. The trading position for the year ended 30 June 1997 showed gross sales declining to \$814,000 with gross profit also declining to 5 per cent. When wages and other expenses are accounted for, this represents a significant net loss of \$120,000. The review could only speculate about the outcomes for both financial years in the absence of all the facts. However, it pointed out that, in respect of the 1995/96 trading result, gross profit levels were poor, below those even for large supermarkets, and well below the levels for stores of equivalent size. With regard to the 1996/97 trading result, the review concluded that the substantial deterioration might be due to factors that included extremely poor management, large amounts of theft, stock shrinkage or loss, and possible fraudulent behaviour.

A key element of the review was to assess the potential savings that might be achieved by combining the purchasing power of the community stores. This potential was examined against the then current services offered by various wholesalers, taking into account a range of factors such as freight costs, special volume rebates, and special purchasing deals. The issue of savings was also examined in the context of a potential purchase of a retail outlet in Katherine. The review recommended that negotiations be initiated with identified

wholesalers and that, as far as management options were concerned, four immediate steps were necessary. These were negotiation with wholesalers for special purchasing deals; ensuring that adequate mark ups were made on stock; ensuring that goods were sold at stipulated prices; and minimising theft through employing trained and competent staff and providing timely account operating reports on at least a quarterly (and initially a monthly) basis.

The review also canvassed management options with an eye to advancing the regionalisation of store operations. In ascending order of centralised control these were as follows:

- that each store in the region might be independently run but with a purchasing officer at only one store with responsibilities for ordering goods for all stores;
- that stores might be leased to the Jawoyn Association with a guaranteed lease (and optionally a percentage of profit) return to the respective councils; under this arrangement, the Jawoyn Association would control management from one community store which in turn would handle all management and finance with only day to day management at other stores;
- that the first two options be combined, with the addition of a Katherine-based retail outlet as the central store for purchasing; and
- that all stores might be managed by a central management company or shop committee represented by the community store council, with one community providing the management base.

The review recommended that this last option be adopted in order quickly to improve the performance of the stores. It also recommended that a senior store manager's position be created at either Barunga or Wugularr. In addition to the normal management duties this person would also be responsible for:

- receiving and collating all stock orders from the stores and placing orders with the wholesaler;
- ensuring point of sale systems are being implemented, maintained, and used correctly;
- setting operating budgets for all stores and ensuring other store managers comply with these budgets; and
- reviewing the trading results of all the stores and reporting these to the shop committee.

Recruitment of a senior manager to fulfil these duties was seen as critical: the costs of maintaining the recommended systems via consultants and accountants would be prohibitive. The review also recommended that a combined shop committee be formed with representatives drawn from the existing individual shop committees and the Jawoyn Association. This committee would be responsible for the selection of managers and for termination of their contracts, and managers would be required to sign a management agreement (contract) with the committee.

Recent developments

Subsequent to this review, the three stores in the region have assumed more stable management and elements of the regional approach have been adopted by default, with the manager at Barunga store assuming responsibility for the store at Wugularr. Other aspects of the Lewis Review recommendations have also been implemented. Although the current trading position of the three stores remains unknown, the key operational features of each store at the end of 1999, as outlined by each manager, are described below.

The Barunga store operates under the auspices of the Barunga Progress Association which holds a formal lease from the relevant Aboriginal Land Trust established under the *Aboriginal Land Rights Act (NT) 1976*. While the Progress Association currently has its own constituted committee, there is reportedly an agreement that it will be subsumed under the CGC. One unknown consequence of this potential merger are the implications for the application of the Goods and Services Tax (GST). The store employs five full-time employees and two part-time employees. The current managers (a husband and wife team) are not employed under a written contract.

In line with the recommendation of the 1998 review, the store's principle wholesaler is Australian Independent Wholesalers. Most dry goods have a 45 per cent mark-up which translates into a gross profit of approximately 31 per cent. Current management is actively engaged in encouraging better nutrition, and in line with this policy fruit and vegetables have a minimal mark up while baby food, baby bottles, and baby nappies are sold at cost price. Fresh sandwiches have been added to the range of take-away foods and, in an attempt to reduce costs and ensure leaner cuts of meat, a butchery has been established at Barunga store with meat imported in bulk directly from South Australia and processed on site.

A significant development in terms of options to improve household and individual budgeting has been the successful introduction of EFTPOS. A total of \$40,000 is turned over each month using this facility. Electronic scanners have been installed at the main check-out counters in order to improve stock and pricing controls and to ensure compliance with GST requirements. Book-down arrangements remain a dominant feature of the store's operation. However, it is anticipated that these will decrease over time with the uptake of the EFTPOS facility and the establishment of a local branch of the Traditional Credit Union (TCU), which occurred at the end of January 2000. Overall, on the financial side, the store manager estimates that turnover exceeded \$1.6m (including gross sales of alcohol at \$4000 per week) during 1999, yielding a 30 per cent gross profit.

Improvements to the infrastructure have been more difficult to achieve. Basically, the Barunga store is in urgent need of replacement or at least of a significant upgrade. The building is an aging corrugated iron shed which is difficult to regulate for temperature and pest control. Refrigeration units are stretched to capacity and have faulty seals, and both storage and meat processing areas are functionally inadequate.

For the Wugularr store, concurrent management with Barunga store commenced in September 1999 at the request of the Beswick Progress Association (BPA). It is important to note that there is no formal lease reflecting the terms and conditions of this arrangement.

According to the store manager and the Town Clerk at Wugularr, the store operates under the auspices of the BPA but without a formal lease from the Aboriginal Land Trust because some of the existing buildings were constructed on a road easement owned by the Northern Territory government and are therefore currently external to the Land Trust holdings. As at Barunga, the BPA committee is currently subsumed by the larger CGC.

Prior to the current management arrangement, the trading position of the store had deteriorated to the point of having an accumulated debt of \$350,000. This dire financial position was reflected in the value of the stock (approximately \$11,000) at the time of handover to Barunga management. Within two months of the new management regime this had been built up to around \$85,000. Also in place is an arrangement whereby rental payments to the BPA of \$8000 per month are used to retire debt, with a total of \$30,000 having been paid as at November 1999. While gross receipts for the store were unavailable, turnover in alcohol sales at the end of 1999 was high at \$4000 per week, while the EFTPOS facility accounted for over \$12,000 per month.

By the beginning of 2000 a number of positive developments appeared to be in place at Wugularr. The store employed four people full-time on CDEP wages; a bakery was fully operational and was producing fresh bread for the Wugularr store and Barunga, including wholemeal and high fibre varieties, and breads supplemented with essential vitamins; a take-away facility had been established; and electronic scanners had been installed to assist in financial management. However, a number of structural difficulties remained. Following widespread flooding early in 1999, the store was completely rebuilt using ATSIC monies. Unfortunately, reconstruction occurred on the same site; the store was flooded again and closed down for a period during the following wet season. In the absence of air-conditioning, summer heat remains a problem both in terms of the shelf life of stock and working conditions. It is also reported by the Wugularr Women's Centre that the supply of fresh fruit and vegetables is inadequate: the Centre has taken to purchasing stock from an itinerant trader to set up an alternative point of sale. The sale of alcohol from the store is a contentious issue: health workers regard it as conflicting with the store's efforts to improve health outcomes.

Unlike other stores in the region, Manyallaluk store operates alongside the community's successful tourist enterprise under a proprietary limited company which is subject to independent accounting and auditing supervision. While consideration has been given to the possibility of detaching the store from the existing company structure and including it as part of the operations of the Manyallaluk community, the link to the tourist enterprise has beneficial spin-off. Although the population at Manyallaluk is small, the store also supplies the large number of tourists who camp at Manyallaluk each year. This raises the market threshold and the cash turnover in sales averages to as much as \$35,000 per month.

A particular feature of the management regime is the implementation of an active food policy including the promotion and subsidisation of fresh fruit and vegetables, the provision of only a limited range of high fat and high sugar products, and a ban on alcohol sales. The store also extends its good food policy into the community. In conjunction with the Women's Centre, it operates a meals on wheels service for pensioners, and a school lunch program for children who travel to Barunga each day to attend school.

Store food policies

In September 1999, a meeting of store managers, representatives of the Jawoyn Association, the Fred Hollows Foundation, and community representatives was held to discuss the proposed nutrition component of the Nyirranggulung Health Strategy. The meeting reached a general consensus that the nutrition project needed to:

- explore options to strengthen and improve the operations and management of the community stores, including their profitability, through regional management, joint planning, and improved accountability;
- assist the stores to manage the transition to the GST, including providing advice and possible assistance in relation to computer scanning equipment;
- assist in improving people's access to food and the affordability of food;
- consider options to boost local production (e.g. the proposed fish project at Wugularr);
- employ a nutrition project worker to work with stores, community councils, schools, clinics, and community members; and
- improve personal and community understanding of health issues (Cronin 1999).

The quality, variety and price of foodstuffs are all factors that can be influenced to a degree by conscious interventions on the part of store managers or management committees. Shopping habits and levels of sales of particular items may also be steered by strategic marketing, packaging, and display. The decisions made by store managers in pursuit of what may be described as a store food policy have found, in previous research by Lee, Bonson, and Powers (1996) in Aboriginal communities, to be vitally important in determining the uptake of healthy foods by a community. This study, which focused on evaluating the effectiveness of nutrition projects in remote Aboriginal communities in the Northern Territory, concluded that individual store managers can be a greater determinant of nutrient intake than the community itself.

Store managers can employ a wide range of strategies aimed at raising the nutritional value of foodstuffs purchased. The available evidence shows that adoption of such strategies can raise nutritional status, with consequent effect on health outcomes. Among the most effective are the sale of breads fortified with iron, vitamin B1, and niacin which are effective in reducing iron deficiency anaemia; healthy shopping educational tours of stores demonstrating which foods are high-fat, high-sugar, or high-salt and which are low in these elements; store-organised food tasting sessions; reductions in operational days for take-away food outlets; and the recruitment of community people to assist in running store-based nutrition programs (Gracey et al. 1999: 64, 81, 92).

Store managers exercise considerable control over the supply of food in remote communities. It is essential, then, that they be viewed as allies in efforts to improve Indigenous dietary intake (McMillan 1991). Stock management strategies and the beliefs and attitudes of individual store managers play a key role in determining the types of foods supplied. This was highlighted in the evaluation of a nutrition project conducted in three separate communities in the Northern

Territory, where over a 12-month period one community recorded a significant increase in dietary density of both thiamine and dietary fibre. The manager of the store concerned took an active interest in Aboriginal health, ensured that fruit and vegetables were kept in cold storage (with a significant variety under prominent display), and provided wholemeal bread and sandwiches rather than high-fat take-away foods (Lee, Bonson, and Powers 1996). The study concluded that the development of effective partnerships between Aboriginal consumers, store managers, and health professionals is a necessary prerequisite to addressing nutritional issues over the longer term.

A successful example of such a partnership is provided by the experience of ALPA, which has maintained a long term commitment to improving nutrition by implementing a nutrition policy in all its remote community stores. The policy involves the adoption of specific objectives which focus on replacing certain foods with healthier choices (e.g. canola oils replace high fat oils), stocking nutritious foods (e.g. fruit and vegetables, and fruit juices), introducing sandwich-making as a substitute for high-fat take-aways; employing nutrition workers ('good food people') in the stores, and maintaining a freight subsidy on fresh food and vegetables.

The ALPA food policy was the result of a number of steps taken over a three-year period. This included initial studies of communities to identify areas in need of improvement and those aspects of the food supply already under local control. Following this came a period of negotiation and drafting of the policy, and overseeing inter-sectoral collaboration. ALPA also sought an independent review of the policy by comparing food and nutrient turnover in each community store before and after policy implementation (Lee, Hobson, and Katariski 1996). The findings of this review are significant in the context of planning for nutrition intervention:

- in terms of dietary changes, all stores had an increased intake of fruit and vegetables, particularly those stores that stocked the greatest variety;
- a major shift towards the use of canola oil and margarine occurred;
- uptake of fruit juices and diet carbonated drinks was variable;
- there was no discernable change in sugar intake;
- in terms of dietary change as measured by nutrient density, all communities reported a reduction of energy derived from fat and saturated fat, and to a lesser extent from sugars, with a converse increase in energy derived from complex carbohydrates;
- there was an increase in some vitamin intakes but these remained low compared to recommended levels;
- nutrient intakes improved most in those communities that adhered to the food policy;
- promotional shelf displays were only in limited use since they were too easily damaged and subject to stock changes; and
- the availability of sandwiches remained limited (partially due to problems of compliance with health regulations).

The review concluded that the policy needed more promotional and educational initiatives as well as ongoing support and information. It recommended that policy implementation be standardised between the stores and improved by liaison between store managers, health professionals, and community representatives. It concluded that for a nutrition policy to be effective it needs to be dynamic, and structured with the appreciation that development, implementation, evaluation, and reform represent a cyclical process.

Evaluation of a similar set of interventions at Minjilang between June 1989 and June 1990 (involving comparison with another island community) produced data that revealed lasting improvements in dietary intake of most target foods (including fruit, vegetables, and wholegrain bread) and nutrients (including folate, ascorbic acid, and thiamine) among 68 study participants. Also noted was a significant decrease in dietary intake of refined sugar and saturated fat, and an increase in the consumption of foods with higher levels of micronutrients. These dietary shifts were associated with improvements in several indicators of nutritional status including lower serum cholesterol levels, increased red cell folate, serum pyridoxine and plasma ascorbic acid levels, lower blood pressure, and a normalisation of body mass index.

The program was more successful at Minjilang than at the community with which it was compared. It was linked to an ongoing process of social change driven largely by the local people themselves. The initial intervention demonstrated that, over the short term at least, (some) Aboriginal people could improve their nutritional status. The lingering issue is how to make this sustainable and applicable to the whole of the community. The review concluded that when Indigenous people themselves control and maintain a sense of ownership of community-based intervention programs, then nutritional improvements can be initiated and sustained.

The Queensland Department of Aboriginal and Torres Strait Islander Policy and Development (DATSIPD) and the Department of Queensland Health have developed a proposed store nutrition policy with the objective of making healthy food the easy and affordable choice for residents of remote Indigenous communities. The policy has been progressively implemented and trialed in the DATSIPD operated stores of Woorabinda, Palm Island, Lockhart River, Pormpuraaw, Kowanyama, and Doomadgee since November 1998. The policy seeks to formalise a conscious strategy to significantly improve the range and quality of healthy foods that has been in place since DATSIPD's assumption of direct managerial control of the stores in 1995. Improvements that have resulted include an average increase of 42 per cent in kilogram weight of fruit and vegetables sold through the stores over the trial period. A total of \$1.5m has been spent by the Queensland government in upgrading store refrigeration and a further \$1.5m has been expended by the stores themselves on repairs and maintenance and computer software (pers. comm. Bruce Peel, Queensland DATSIPD, January 2000). The stores have also invested heavily in training staff in best practice handling, in the storage of fresh produce, and in securing competitively priced suppliers.

As well as being consistent with strategies to improve remote community health outcomes, these practices have been influenced by recognition of the commercial advantages of

stocking healthy food lines. They have therefore largely resulted from centrally driven and determined commercial practices, rather than from bottom-up consultative processes aimed at engendering community ownership. Furthermore, no assessment has been made of the impact on dietary intake.

Elements of all of these strategies are now in evidence at Barunga, Manayllaluk, and Wugularr stores, but none are applied within the framework of a formal, negotiated, purposeful food and nutrition policy, nor are they subject to ongoing evaluation. In assessing their impact, consideration needs also to be given to the links between store operations and other community-based nutrition strategies. The prime example is the expenditure of \$30,000 per annum on Meals on Wheels for pensioners in Wugularr. Also, Wugularr CDEP participants contribute \$5 per week to assist in providing school meals. This scheme is administered by the Wugularr Women's Centre which employs a full-time coordinator and eight women on CDEP wages. Each weekday, the Centre provides 85 school lunches for local primary school children and 15 lunches for children attending the Women's Centre creche. In addition, they provide 36 school lunches for children travelling to Barunga Community Education Centre.

As noted earlier, weekly stocks of fresh fruit and vegetables at the Wugularr store are sufficient only for two days. Consequently, the Women's Centre is forced to make its own arrangements to purchase fruit and vegetables for the remainder of each week. This shortfall is financed by a small mark-up on sales plus income acquired from the sale of arts and crafts. Over the two months of December 1999 to January 2000, the Women's Centre expended \$12,000 in this way to provide school lunches. A similar functional link exists between the store and Women's Centre at Manayllaluk and while this symbiosis is to be encouraged, the situation in Wugularr underlines the vulnerability of community-wide nutrition strategies to the varied fortunes of store operations.

5. Food acquisition

At its simplest level, the purpose of a nutrition strategy is to influence the type and quality of foodstuffs acquired by consumers, so that their food consumption is more in line with a healthy diet. If this were solely a matter of ensuring that store shelves were appropriately stocked then the achievement of improved nutritional status in Aboriginal communities would be a relatively straightforward matter. However, a number of other factors impinge to substantially affect food acquisition. These include behavioural factors such as individual preferences for particular foodstuffs, which in turn may be heavily influenced by education, information about healthy eating, advertising, and attitudes and beliefs about diet. Whatever people's preferences may be, these are always constrained (or even directed) by economic factors including the price of food set against disposable income, and expenditure on non-food items. Also of importance is the ability of individuals and households to manage and budget their income—in arranging to pay third parties, purchasing food, goods and services, and in maintaining a level of financial and economic independence and planning. These are all dependent on informed access to appropriate banking and financial services.

Food preferences

Very little is known about the food preferences of Aboriginal people. This is a major drawback in any effort to develop educational and marketing tools aimed at beneficially influencing food purchasing behaviour. Such knowledge of food preferences as is available is derived from studies that have sought to quantify actual purchases from community stores. While providing some measure of food preference, the range of items purchased from stores is constrained by other factors and may not necessarily equate with items that people prefer.

A significant finding from these studies concerns the age and gender pattern of shopping. Women are the predominant purchasers of foods, and children have considerable discretion in buying (Rowse et al. 1994; Sibthorpe 1988). In one remote Central Australian Aboriginal community, an initial survey of 7000 transactions comprising all food purchases from take-away and retail outlets was conducted over a two-week period. The survey revealed that 72 per cent of all food purchases were made by women, and that in dollar terms, 82 per cent of all money spent in the community was expended in the stores. The study also showed that children aged under 15 years spent 74 per cent of their food money on take-aways and this practice became less frequent as people got older—up to the 40–49 age group, which spent 19 per cent of food money in this way. It then increased, with the 50–59 age group spending 25 per cent on take-aways (Rowse et al. 1994). Similar patterns have been observed in Arnhem Land communities, with women doing most of the household shopping except in respect of take-aways (McMillan 1991).

A critical factor in food-purchasing behaviour is the extent to which income is expended on the purchase of alcohol. Direct information on this issue in respect of residents of the Katherine East region is not available, but a report to the Jawoyn Association on

establishing a holistic treatment system in tackling substance abuse in the Katherine District does provide a measure of intoxication for the population (Magnery 1999). The report indicates that of all those admitted to the sobering-up shelter in Katherine between July 1998 and June 1999, a total of 341 out of 4125 (9%) were from Barunga and 249 (6.5%) were from Wugularr. In addition to this some 3807 persons were detained in police cells for intoxication over the same period. If we assume that those from Katherine East formed part of this group in similar proportions to those reported above, it underscores the fact that the purchase and consumption of alcohol should be viewed as a major issue in any attempt to address nutrition and health status in the region. Accordingly, the Jawoyn Association has made representation to THS for funding to establish various strategies aimed at reducing alcohol dependence as a key element of the Nyirranggulung Health Strategy.

To the extent that actual consumption patterns reflect food preferences among Aboriginal people in remote communities, the following findings from a range of inquiries into purchases from community stores (Brady and Palmer 1991; Goto 1999; THS 1995) provide a reasonable benchmark.

- Most people make a very limited selection of foods, with just three foods—sugar, beef, and white flour—together providing half the energy intake of most communities. Stores on bigger communities tend to be able to offer a wider range of foods and as a consequence their customers' diets are more varied.
- Sugar consumption is very high, averaging out at 50 teaspoons per day. The highest recorded average is 93 teaspoons per day, in a Central Australian community in 1987. This consumption mostly comes from sugar in tea and from soft drink (which averages 10 teaspoons of sugar per 3 cans of soft drink).
- Fat intakes are very high, and are derived from fatty beef and lamb and take-away foods.
- Fibre intake is less than half that recommended for the general population, partly due to a reliance on white bread and the white flour used in making damper (wholemeal flour makes a poor traditional damper).
- Salt is used at a level about five times above the maximum level recommended for the general population.
- Fruit and vegetable intakes are very low throughout the Territory, with remote stores selling half the fruit and one-quarter of the vegetable intake per capita compared to the overall Australian community.
- Against recommended levels for the general population, many vitamin and mineral intakes are low, including Vitamin A, riboflavin, Vitamin B6, niacin, folate, magnesium, zinc, and copper.

The introduction of scanning technology into the Barunga and Wugularr stores, and soon at Manyallaluk, raises the prospect of conducting similar audits of food purchasing over selected periods of time in order to monitor shifts in buying (consumption) behaviour. This is assuming, of course, that all store purchases (including take-aways) are scanned.

The role of education

The 1993 Commonwealth National Food and Nutrition Policy identified a need to support the development of food and nutrition education curriculum materials for schools through program development and teacher training. In constructing the Northern Territory Food and Nutrition Policy 1995–2000, a series of background papers were prepared for THS, one of which examined the role of health and nutrition education for Aboriginal school children (Glasgow 1995). These papers reviewed relevant curriculum materials available for use at primary and secondary levels through to adult education in communities and in urban schools. The papers noted some improvement in the development of curricula but it was also conceded that food and nutrition education had been implemented in an ad hoc manner, that it was subject to limited time allocations, omitted from teacher training, lacked priority and profile, and had been placed on the curriculum as an elective subject. Consequently, improvement in curriculum content with greater emphasis on food and nutrition was recommended, in recognition that nutrition education would be more successful and sustainable if it was promoted as an essential part of all school-based activities. The reports also recognised the need for funds to be allocated to develop staff professionally in the area of health and nutrition alongside enhanced community involvement in the decision making, planning, and delivery of food and nutrition activities at schools.

One of the four priorities identified in the Northern Territory Food and Nutrition Policy and Strategic Plan 1995–2000 was to increase access to nutrition education in the Territory for consumers, educators, health professionals and for training the nutrition workforce. There is currently no evaluative data on the effectiveness and outcomes achieved through the detailed actions listed under the strategy: nutrition education is provided as part of the standard school syllabus at Barunga Community Education Centre, but no assessment of its effectiveness is available. The role of education in nutrition has again been identified as a priority in the proposed 2000–05 strategy in terms of ‘promoting healthy eating habits in school-aged children’.

A report by Rowse et al. (1994) is one of the few pieces of research that has sought to evaluate an intervention specifically directed at changing the food purchasing behaviour of Indigenous school children. The research was conducted in an Aboriginal community in Central Australia. Following on from this detailed analysis of food transactions, school-based and community-based nutrition program activities were developed by health professionals with the support of the local community council and a productive relationship was established with one of two store managers, contributing to improvements in the variety of foodstuffs sold. Special markers were developed for use in the store to promote healthy foods. As a consequence, improvements in sales of healthy or ‘encouraged’ foods and decreases in sales of ‘discouraged’ foods were recorded in the store where the manager was cooperative (apart from a significant increase in sales of large bottles of soft drink to Indigenous males), and little or no change was recorded in the store where the manager did not cooperate.

However, a follow-up study of outcomes eight years later found that while store turnover data suggested a reduction in the consumption of refined carbohydrates and saturated fats, there was a trebling in obesity prevalence among young women (aged 15–24 years) and a four- to fivefold increase in diabetes prevalence overall (McDermott et al. 2000). This study concluded that interventions targeting nutritional factors alone are unlikely to greatly alter trends towards increasing prevalences of obesity and diabetes. In communities where healthy food choices are limited, the role of regular physical activity in improving metabolic fitness also needs to be emphasised.

The price of food

At the point of sale of foodstuffs, three economic factors interact to influence substantially the acquisition of particular types and quantities of foodstuffs by individuals and families. These are price, income, and expenditure. The income status of Aboriginal people in the Katherine East communities has already been discussed (see Ch. 3). This section considers the issue of price.

A capacity to monitor, and where possible control, the price of foodstuffs at the point of sale and acquisition is an essential element of nutrition intervention strategies. This is especially so in remote Aboriginal communities where the high cost of food has been shown to impact directly on poor nutritional status (Sullivan et al. 1987). Many factors influence the price of foods, including direct production costs, demand, and international price fluctuations, as well as indirect imposts such as transport, storage and handling costs, and taxes. There was a major change in the last mentioned following the introduction of the GST in July 2000. While the precise details of price changes resulting from the replacement of the Wholesale Sales Tax by the GST remain unclear, most foods (with the exception of prepared food, take-away food, confectionery, ice cream, soft drinks, alcoholic beverages, and non-bread bakery products) are exempt, while reductions in the diesel fuel excise rate should flow through to store prices via lowered transport costs. And, as already noted, prices can also be controlled by store managers through a policy of differential mark-up.

Formal mechanisms are in place at Barunga and Wugularr (but not at Manyallaluk) to monitor price changes over time as well as to establish price relativities both between stores in the region and between these stores and those elsewhere in places such as Katherine (at least in respect of a defined 'healthy basket' of goods). The monitoring device is the Community Market Basket Survey conducted annually by THS. This survey developed as a result of the concern to ensure that the price of healthy foods was monitored; hence the focus on a standard 'healthy food basket' of 28 items. In addition to the price of goods, the quality and variety of selected food items is established. By benchmarking these variables the survey creates the capacity to assess changes in price, quality, and variety that may occur due to strategic interventions. It also allows for assessment of the capacity of community residents, given their incomes, to purchase a 'healthy basket' of food sufficient to feed a 'typical' family of six persons for 14 days. The assessment is currently based on an estimated fortnightly income from welfare payments of \$1389 for this 'typical'

family, as calculated by the Department of Social Security in October 1997. This estimated income is set against the local cost of a healthy basket of food to establish the share of income required for its purchase.

The methodology employed in the surveys merits scrutiny because it affects the nature and scope of the data. The surveys are conducted annually and the data refer to a single day (usually in May of each year). Given the vagaries of store management and of food supply, the timing of each survey can thus be crucial in determining results. The surveys are a recent innovation, and no time series has yet been established. If a price cannot be established for items in community stores, then the town-based Woolworths price is substituted: this may have the effect of deflating overall prices. No distinction is drawn between healthy and non-healthy take-away foods, and the focus on healthy foods means that frequently purchased non-healthy items, such as carbonated soft drinks and potato chips, are not recorded. Finally, as noted above, the fortnightly income for the 'typical' family of six persons is based on welfare payments current in October 1997 and is thus out of date.

With these limitations and biases in mind, the cost of purchasing components of a 'healthy basket of goods' at Barunga and Wugularr Stores in May 1999 is shown in Table 5.1 and compared with the district average and with Woolworths in Katherine. Overall, food costs in Barunga are 30 per cent higher than in Katherine, while in Wugularr they are 38 per cent higher. To place these price relativities in wider perspective, Katherine food prices are in turn 13 per cent higher than Darwin prices for a basket of goods (Legislative Assembly of the Northern Territory 1999: 60).

Table 5.1 Relative fortnightly cost of food items: Community Market Basket Survey, 1999

Food category	Barunga (\$)	Wugularr (\$)	District average (\$)	Woolworths (\$)
Bread & cereals	70	87	73	56
Fruits	107	163	135	109
Vegetables	136	95	107	81
Meat and eggs	79	73	76	54
Dairy	75	83	80	64
Other foods ^a	24	22	21	15=
Total basket	491	523	491	379

Note: a. Includes margarine, sugar, and tea.

Source: Territory Health Services, Katherine.

The prices of all bread, cereal, meat, poultry, dairy, and other products in community stores are consistently higher than Katherine prices by around 25 per cent. Fruit and vegetables display substantial variation: fruits are relatively expensive in Wugularr (50% above Woolworths) but vegetables are not. In Barunga the reverse situation holds: vegetables are 68 per cent more expensive than at Woolworths. Overall, the total cost of a healthy basket of goods at Barunga (\$491) represents 35 per cent of the 'typical' family income, leaving \$897 for other items. In Wugularr, a healthy basket of food costs more

at \$523, and the share of total income required is also higher at 38 per cent, leaving \$866 for other items.

A range of other data items are available from the Community Market Basket Survey including whether stores have a store management committee or a food nutrition policy, the number of Aboriginal and non-Aboriginal workers employed at the store, the number of trainees, and whether the store supports sporting and school activities as well as religious, cultural and funeral activities. Also indicated is the variety (different forms) of individual food groups—for example different types of vegetable, fruit and meats.

Expenditure

To the extent that the acquisition of recommended foodstuffs represents a key goal of any nutrition intervention strategy, it is necessary to measure household and individual expenditure patterns in order to establish what share of total expenditure is available and devoted to this purpose. While failure to purchase sufficient and recommended foods may result from inadequate income, it may also be an indication of spending preferences. It is known from the ABS Household Expenditure Survey that, in Australia generally, low-income households (and individuals) spend considerably less on food compared with the more affluent, but the proportion of total expenditure that this represents is significantly greater (ABS 2000). Indeed, so robust is this relationship that the proportion of household income expended on food is generally accepted as an indicator of deprivation and poverty (Saunders 1994: 288).

Currently, there are no rigorous and systematic data for the Katherine East communities with which to illuminate these issues, although evidence from the few studies that have been conducted in other remote Aboriginal communities points to a pattern of cash feast and famine associated with the fortnightly round of welfare payments (Beck 1985: 89; Rowse 1988; Westbury 1999). If greater knowledge about patterns of expenditure were to form part of the Nyirranggulung Health Strategy, a key concern would be the options for conducting the necessary research and the methodological considerations involved.

The recent acquisition of electronic scanning technology by community stores makes it easier to track and quantify one key area of expenditure—store purchases—with the added bonus of possibly linking the information to individuals, or at least to households. At this stage, however, this remains only a possibility. The ethical status of such a household surveillance system and of the means used to achieve it would obviously need to be fully canvassed with individuals using the store before any serious consideration was given to incorporating such a device into a nutrition strategy.

However, not all individual and household spending on food items occurs at community stores, and this is especially relevant in the context of high and frequent mobility both within the region between the communities of Katherine East as well as to places outside of the region, particularly to Katherine. For this reason alone, a special survey would be required if the aim was to capture all expenditure on foodstuffs. Moreover, a full expenditure survey, encompassing all cash outlays, would be required to capture the allocation of fortnightly income to items other than food.

One issue for consideration in the initial stages of contemplating such a survey would be whether it should involve the whole community or just some selected sample thereof (e.g. volunteer individuals or families). The usual focus for expenditure surveys is the household or family, since this is typically the unit within which economic decisions are made. This presents an issue for survey design: as was noted earlier (Ch. 3), family structures within Aboriginal households and the economic boundaries of such households are difficult to define because of the broadly-defined kin relationships, flexible child-care arrangements, and high levels of local mobility attested for Aboriginal populations (Finlayson 1991; Finlayson and Auld 1999; Martin and Taylor 1996; Smith 1991, 1992; Smith and Daly 1996). In such circumstances, it is difficult to isolate stable income units operating within a physical dwelling. It is equally difficult to differentiate between 'visitors' and 'usual residents', and between natural and other kinds of dependent offspring (Smith 1991; Smith and Daly 1996). This has been the case even in dedicated Indigenous surveys such as the 1994 NATSIS, where the relational classification of household members was a stated goal.

While 'household' may be a useful concept for referring to a physical dwelling and the people resident therein, it is not necessarily the effective economic unit—neither in terms of members' arrangements for the common purchase and consumption of food, nor in terms of their expenditure and savings capacities, the payment of domestic bills, or the sharing of resources and commodities. Rather, the effective arena for eliciting income and expenditure patterns for many household members is a more widely constituted set of socioeconomic relations across households.

Such extended economic units are more appropriately referred to as 'linked households' or 'household clusters' (Smith 1991, 1992). This type of unit constitutes an important economic formation in many Aboriginal communities and is reported in the literature as the basis for cooperative efforts—for subsistence production, for food purchases and capital accumulation, for shared ownership and use of resources such as vehicles, boats, generators, and fridges, and for the payment of household accounts. The impact of inter-household sharing is to ameliorate the often considerable income disparities between households, and associated differences in expenditure capacity, and is especially critical for those with low or intermittent incomes (Altman 1987; Finlayson 1991; Finlayson and Auld 1999; Rowse 1988; Smith 1991). While the identification of such economic units would therefore be a necessary part of any survey targeted at more than just the individual level, this would be a complex and labour-intensive task. There are considerable difficulties in measuring such informal transactions and their related support networks and comprehensive coverage would only be possible through long-term field research. Indeed, partly because of the problems of collecting the data, there have been few attempts to construct such a survey among Aboriginal populations.

In planning any expenditure survey consideration would therefore need to be given to the level of detail required and the period of time for which expenditure data were to be sought. At the very least, information about expenditure on food items would be required, preferably over a fortnightly income cycle, and ideally expenditure on all items would be recorded in such a way as to establish a 'usual' expenditure pattern. Given the level of

intrusion into the lives of people that such a survey would require, it may be that a partial survey of volunteer households who are supportive of the aims of such an exercise is the only possible option.

Financial services—access and equity

The ability of Aboriginal people to manage and budget their income—to arrange to pay third parties, purchase food, goods and services, and maintain a level of financial and economic independence and planning—is reliant on maintaining informed access to appropriate banking and financial services.

Indigenous people's access to and understanding of, banking and other financial services lies at the heart of their ability (or inability) to participate in the cash economy. Fuller participation would improve their general quality of life and, in the longer term, assist in the reduction of welfare dependence (Westbury 1999). At present, Aboriginal people in Northern Australia rely to a disproportionate degree on Centrelink disbursements paid by fortnightly cheque and consequent unregulated book-down arrangements. This is symptomatic of their lack of access to, knowledge of, and equitable participation in Australia's wider financial system.

Rapid changes in the application of new technologies and the associated deregulation of banking and financial services have impacted disproportionately on remote Indigenous communities by distancing them even further from standard financial services (Westbury 1999). As a consequence of the lack of regulated banking services in remote areas, Indigenous people are vulnerable to unregulated providers of financial services. Typically, entitlements are paid by cheque and the cheques are cashed by hotels, stores, hawkers, or taxi drivers. Even where mainstream banking services are available, in towns such as Alice Springs and Katherine, there is widespread evidence of illicit book-down practices (Commonwealth Ombudsman 1997; evidence to the Northern Territory Liquor Commission hearings on Katherine Hotel Motel, September 1998).

The continued maintenance of book-down credit arrangements reflects a long history. For many years Indigenous people have experienced 'book-down' as normal practice, essential to their continued wellbeing. A significant issue, which emerges clearly from detailed research carried out on Indigenous households, is the problem faced by families in maintaining a cash flow sufficient to carry them through the full fortnight period between the receipt of Centrelink entitlements. This has been variously described as the 'feast or famine', or 'big or slack' weeks phenomenon (Finlayson 1991; Smith and Daly 1996). This pattern is exacerbated by lack of access to banking services: this forces cheque recipients either to cash out their complete entitlements each time they receive them or to enter into informal book-down arrangements with traders.

The decision to establish the Traditional Credit Union (TCU) arose directly from these concerns. The TCU has now been successfully established in a number of remote Indigenous communities in the Top End of the Northern Territory. It is currently providing a full range of banking services including savings, budget accounts, Christmas club

accounts, and cheque accounts. In the communities that it has serviced over its five years of operation, its expenditure and consequent cash flows through community stores have evened out. There has also been a significant increase in the number of individuals (particularly women) successfully acquiring small loans to purchase white goods such as washing machines and refrigerators, and other goods and services (Westbury 1999). In the context of the Nyirranggulung Nutrition Strategy the recent opening (in January 2000) of a branch of the TCU at Barunga in the community store is an important development.

Historically, the communities at Barunga, Wugularr and Manyallaluk have been heavily dependent on book-down credit arrangements through the community stores. This is reflected in the consistently high levels of credit carried by the stores (Lewis 1998; pers. comm. Laurie Hughes, Barunga Store, November 1999). The system could be characterised as a double-edged sword. On the one hand, it provides a form of insurance that ensures access to foodstuffs for wage and cheque recipients (subject to book-down cash limits and prohibitions in relation to alcohol and tobacco) over the fortnightly cycle, and a form of guaranteed reimbursement for the stores. On the other hand, the system also compounds existing welfare dependence and provides no real incentive to accumulate savings or develop the skills required to interface successfully with the cash economy.

Both the recent establishment of EFTPOS facilities at Barunga and Wugularr and the opening of a TCU branch at Barunga are already impacting on the established patterns of income management (pers. comm. Betty Hughes, Barunga Store, January 2000). Some people will find difficulty in adjusting from cheque to electronic transfer of Centrelink entitlements or in opening individual accounts with the TCU, in contrast to receiving cheques via the community store, and will need careful and informed consideration and education. The eventual transition of individual reliance on access to cash and expenditure via the book-down system to management their own affairs as electronic card holders will take some time, and will be more readily accepted by some age and income groups than others.

The TCU is conscious of these issues and has sought funding to provide educational and financial counselling support to people undergoing this transition (pers. comm. Barbara Bradshaw, TCU, January 2000). Centrelink is also currently examining, in partnership with the banks and Tangentyere Council, the potential to run a similar pilot project in Alice Springs. These changes also hold important potential implications for the development of information systems aimed at tracking family expenditure patterns under any proposed food and nutrition program.

6. Food consumption

Within the food and nutrition system, the point of food consumption is pivotal; it marks the junction between all the factors that influence the acquisition of particular foodstuffs and all the consequences in terms of the nutritional value that these foodstuffs impart to individuals and the resulting health outcomes. Thus a means of measuring dietary intake is crucial for any nutrition program.

Dietary intake

From the 1997 review of food and nutrition programs for Aboriginal and Torres Strait Islander people it is clear that there are relatively few studies which quantify dietary intake in Aboriginal communities (Butlin et al. 1997). Certainly, none have been undertaken in the Katherine East region. The most important research in terms of testing the utility of different methods for quantifying dietary intake in remote Aboriginal communities is the work of Lee and various collaborators (Lee 1993; Lee, O’Dea, and Mathews 1994; Lee, Smith et al. 1995).

These studies of gross community dietary consumption show that apparent intake of energy sugars and fat is excessive while apparent intake of dietary fibre and several micronutrients is low. They also provide a successful model for monitoring food intake in communities and linking measured dietary changes to biomedical, anthropometric, and haematological changes in the population observed (Lee, O’Dea, and Mathews 1994).

The various methods available for quantifying dietary intake vary in their validity, reliability and precision. Their appropriateness depends upon whether groups or individuals are the focus of interest (Dwyer 1991). There are two major types of dietary assessment methods—retrospective and prospective. In the former, data are collected days, weeks, months or even years after consumption has taken place, and include 24-hour recalls as well as food-frequency questionnaires. Retrospective methods can also be classified according to the time period of interest—the immediate past, a few days past, or a ‘habitual’ diet over a longer time period. Prospective methods include the use of food diaries, weighed intakes, store invoices, electronic food records, and constant observation by a trained observer. The strengths and weaknesses of each of these methods in a general population context have been well reviewed by Bingham (1987).

The effectiveness and applicability of a series of different methods for measuring dietary intake in the context of remote Aboriginal communities has been tested by Lee, Smith et al. (1995). These include:

- weighed dietary intake, where food is weighed immediately before consumption and any waste is weighed afterwards;
- 24-hour recall, where individuals were interviewed to recall all foods and beverages consumed within the previous 24 hours;

- food frequency, for which a food frequency questionnaire was devised to include commonly available foods stocked in the community store and relatively inaccessible foods available only in regional urban centres. Individuals were asked to indicate how frequently each food was consumed over a fortnightly income cycle, with prompts such as 'every day', 'nearly every day', 'only on pay day' etc.;
- diet history, using the classical dietary history method to assess the 'usual' dietary intake;
- store turnover method, where store invoices are used to list all food items delivered to the store during a preceding specified period and then used to establish total quantities of each food supplied. These are tabulated to calculate average daily supply. The mean daily store turnover is then assumed to approximate the mean daily dietary intake or the apparent consumption of the community.

Table 6.1 Comparative assessment of dietary intake methods in remote Aboriginal communities: (a) Negative characteristics; (b) Positive characteristics

(a) Negative characteristics

	Weighed records	24-hour recall	Diet history	Food frequency	Store turnover
Intrusiveness	4	2	3	2	1
Time required	4	2	3	3	1
Personnel required	4	3	3	3	1
Travel costs	4	3	3	3	1
Resources required	1	3	2	2	1
Lack of individual data	1	1	1	1	4

Note: Negative characteristics were rated on a scale of 1 to 4, with 1 as the least negative and 4 as the most negative score.

(b) Positive characteristics

	Weighed records	24-hour recall	Diet history	Food frequency	Store turnover
Community acceptance	1	2	1	1	4
Measures usual diet	1	1	2	2	no data
Provides retrospective data	no data	1	2	1	4
Suits Aboriginal involvement	1	2	1	1	3
Results reproducible	1	1	1	1	4
Cost effectiveness	1	2	2	2	4

Note: Positive characteristics were rated on a scale of 1 to 4, with 1 as the least positive and 4 as the most positive score.

Source: Lee, Smith et al. 1995.

Table 6.1 summarises the negative and positive aspects of each of these methods as observed in a coastal community of the Northern Territory and in a central desert community. The emphatic conclusion is that the least intrusive and most effective method in terms of time, cost, and personnel is the store turnover method. This also scored highest on community acceptance (which is vital), provision of retrospective data, capacity for Aboriginal involvement, and potential for wider application. The store turnover method was also less vulnerable to bias than the other methods tested.

Estimating nutritional intake

The nutritional quality of food with respect to a particular nutrient depends on the nutrient density relative to energy density. This can be assessed by calculating the nutrient density score, a measure based on Recommended Dietary Intakes (RDIs). In deriving the apparent consumption of nutrients in any diet, those that are commonly estimated are the macronutrients (protein, fat, carbohydrate, and alcohol), energy, vitamin A, vitamin C, thiamin, riboflavin and niacin, and calcium and iron. Nutrients that are generally not estimated, but for which there are RDIs, include sodium, potassium, magnesium, zinc, phosphorous, iodine, folate, vitamin B-6, vitamin B-12, vitamin D, and vitamin E. Food composition data on which calculations of nutrient supply are made change over time along with variations in food supply and available scientific evidence.

With this data, information on food turnover derived from the store turnover method has been successfully used to derive apparent nutrient turnover, using customised software. This is then converted to apparent per capita nutrient intake which can be compared with RDIs to assess the adequacy of food supply. Using this method, Lee, O’Dea, and Mathews (1994) found that the greatest contributor to available energy in Aboriginal communities in the Top End of the Northern Territory was carbohydrate, with refined sugars contributing approximately 30 per cent of total energy—three times the recommended level.

Limitations of the store turnover method

One of the limitations of the store turnover method identified by previous studies may have been largely eliminated by the introduction of electronic scanning machines at check-outs in community stores in Katherine East. In the absence of these, the method relies on labour-intensive scrutiny of paper invoices to record stock acquisitions, while bulk storage of items and slow turnover can lead to a misleading estimation of turnover. With scanning technology, measurement of turnover is more accurate and immediate since it focuses solely on output or purchases. It also opens the possibility of adjusting turnover data to household characteristics such as the proportion of adults and children, although the actual distribution of foodstuffs once they leave the store remains beyond the scope of the method. Of course, the benefits of scanning are only as good as the technology itself and the extent to which all items for sale are scanned. For example, some take-away foods are not currently scanned as they are locally produced and are not line items.

However, no matter how turnover data are gathered, the method still relies on Australian food composition data to derive nutrient equivalents and these standards may not be appropriate for foodstuffs available in Aboriginal communities. For example, the nutrient composition of perishable items may be affected by long-distance transport while the proportion of fat in meats may differ from that laid out in general standards (Lee, O’Dea, and Mathews 1994). Some adjustment to nutrient estimates may be necessary to account for this.

A significant limitation of the store turnover method in estimating dietary intake derives from the requirement to express this in per capita terms since this requires accurate, up-to-date data on the size of the base population—basically the population that obtains foodstuffs from the community store. Once again, however, scanners provide a potential solution to this problem: they make it possible (via the monitoring of book-down) to record the sale of foodstuffs on a household basis. At the same time, it remains very difficult, using this method, to assess the diet of individuals and the day-to-day variability of dietary intake in the community, although variation across the fortnightly income cycle may be possible to establish on the basis of scanning data. If this is so, store turnover might provide a means of monitoring the impact on food purchases consequent on changes to financial services such as the introduction of EFTPOS and credit unions.

The main drawback of the store turnover method is its assumption that all purchased foodstuffs derive from the community store. This may be so in remote isolated localities, especially those on islands such as Minjilang, where successful applications have been developed. For the communities of Katherine East, however, which are highly accessible to Katherine by road as well as to each other, this assumption is precarious in the absence of any data on shopping habits. Obviously, if the store turnover method for measuring dietary intake were to be adopted, it would be important to first establish these regional patterns of food purchase via a shopping survey.

7. Measurement of nutritional and health status

Nutritional status refers to the condition of the body resulting from the intake, absorption and utilisation of food as well as from factors of pathological significance (Dwyer 1991: 5). Assessment of this status typically includes a range of measurements relating to dietary, anthropometric, and biochemical factors as well as to other considerations such as clinical history. Given the heterogeneous nature of malnutrition as well as methodological limitations inherent in the range of measures available, it is usually the case that multiple indicators are required for an adequate depiction of nutritional status.

Information on the health and nutritional status of Aboriginal people is collected, to varying degrees, as a matter of course in the day-to-day operation of the health care system in the Katherine East region. Current variation in the quality of data available arises because of differences in information technology throughout the system and because of the uneven coverage by health personnel and programs. A further limitation is that many episodes of illness are either not recognised at the individual or household level and for that reason, or for others, are not presented for clinical assessment and reporting.

This variable reporting is just one of the factors that leads to difficulty in establishing meaningful and statistically reliable population numerators and denominators for the calculation of rates and prevalences. If the impacts of intervention are to be measured accurately, it is crucial that only those who have been subject to the intervention are assessed. This requires clear definition of the initial population and the capacity to track individuals comprehensively over time—something that is difficult to achieve in the context of high population mobility. Nutrition surveillance studies have consequently relied on populations that essentially define themselves, in the form of households and individuals who volunteer to participate in the process (Lee, Smith et al. 1995).

The same complicating factor arose in the Katherine West and Tiwi Coordinated Care Trials (CCTs). A key part of the establishment of computerised health information systems in these trials was an initial education campaign conducted at both individual and community levels. The aim was to explain the purpose of data collection and its role in achieving improved health outcomes, and the campaign was conducted as part of a process of seeking individual written consent for the retention and analysis of patient records. In Barunga, where the Coordinated Care Trial Information System (CCTIS) was trialed, it appears that no equivalent process occurred: the community itself was not engaged as part of a CCT and agreements regarding the use of health data for monitoring purposes were therefore not established.

The scope, content and quality of community-level health information available for the Aboriginal population of the Northern Territory has only recently been evaluated as part of the Territory Health Services contribution to the Housing Infrastructure Priority Projects (HIPP)/National Aboriginal Health Strategy (NAHS) evaluation process. This exercise found that two broad categories of data are available: those from centralised records including medical evacuations, hospital morbidity, child growth data, and community infrastructure; and those from health centre day books.

Presently, the most comprehensive set of data regarding Aboriginal morbidity is provided by hospital separations. This is coded and available for all Aboriginal communities in the Northern Territory. From this source it is possible to compile detailed statistics of major morbidity for those individuals who indicate in hospital records that Barunga, Manyallaluk or Wugularr is their usual residence. Importantly, these data can be utilised to generate age-specific rates of hospitalisation in order to allow the monitoring of change in the health profile over time, providing that clinic-based demographic data and hospital admissions data are sufficiently compatible for the former to be employed as a meaningful denominator. This is not a given, and would need to be scrutinised in each case. Data from other sources are more variable in coverage, and their current status is discussed separately.

Health information systems

Community care information systems are currently in a phase of major upgrade and improvement across the Northern Territory, with significant consequences for the future management of clinical and public health strategies. Since 1995, THS have been planning and developing a health information system designed to support and enhance client service delivery through the maximum integration of client information. The key to this is an upgrade in computer hardware, the adoption of standard customised clinical software, and record linkage by means of a common client indicator (or Client Master Index).

In remote communities, the Rural Health Information System (RHIS) is under development to extend the benefits of information technology upgrades throughout the health system. Prototype implementation of this system has been underway at Barunga Community Health Centre (which incorporates Manyallaluk) while full implementation has been established as part of the Katherine West and Tiwi CCTs. The software product supporting the system is the CCTIS which is designed to enhance information access in providing for the case management of individual clients and in building capacity to implement population-based interventions, such as nutrition strategies. The aim is to extend the RHIS with enhanced software to all rural clinics by the end of 2002.

A number of practical issues arise from this extension of the RHIS. At Wugularr, there will be a need to transfer patient information from the current paper-based system to a computerised format. Experience from the CCTs suggests that this requires two people working on site for around three months (pers. comm. Gloria Baillie, THS, Darwin, February 2000). More importantly, the establishment of computerised health information in the CCTs involved a lengthy (12-month) process of community and individual consultations to explain and establish understanding of the use of personal information in health care delivery. For this purpose, a special video and flip charts were developed and consent was sought (in writing) to allow health care providers to gain access to personal health information from hospital records, doctors' records, health centre records and other health registers and for the release of anonymised information to health professionals for the purposes of planning and monitoring health services and outcomes.

Whether or not this process is repeated with the extension of the RHIS, the experience of the CCTs in fully appraising communities about the purpose of data collection and in

obtaining their consent provides an essential model for the development phase of any health intervention strategy. As THS proceeds with this information technology upgrade, it is essential that it is aligned with the emerging Nyirranggulgung Health Strategy. These are complementary processes, and the provision of timely and accurate information on patterns of illness and health service activities is viewed by THS as central to increased community participation in the management and delivery of health services (THS 1997: 7).

Finally, it is important that in-service training be provided for staff using the system. The aim is to make Aboriginal Health Workers fully conversant with the software and its purposes, as well as with basic hardware issues. A related issue is the degree of technical support available to deal with software enquiries and whether the inevitable downtime due to hardware or communication failures along transmission lines can be minimised. These are all labour- and resource-intensive issues and clearly some regionalised sharing of support services would be the most effective strategy.

CCTIS design

The CCTIS has been specifically designed to improve information management in remote community health centres. It promises:

- management of individual client information to ensure consistent follow-up over time, despite factors such as high population mobility and turnover of staff;
- implementation of standardised care plans for those with chronic illness;
- increased involvement of clients in planning their care;
- improved approaches to population screening and early intervention;
- opportunistic screening and treatment services to maximise use of client contacts;
- improved information sharing between providers (e.g. hospitals and clinics);
- improved audit of the quality and consistency of health care; and
- improved monitoring of health outcomes.

All of these are significant developments in the context of the emerging Nyirranggulgung Health Strategy. Of particular interest from a nutrition strategy perspective is the potential presented for building client diaries which could provide the basis for the development of individual and population-wide care plans. Such plans are structured on recall and alert prompts within the software which enable planning of clinic activity to be built around services due to clients. For example, they facilitate the management of immunisations, well women's checks, well men's checks, growth assessment, and screening tests for renal disease, diabetes and high blood pressure. In fact, any type of care plan may be incorporated to suit defined needs and priorities. The system is extremely flexible, allowing the tracking of mobile clients via the Client Master Index which incorporates name aliases and links to relatives for improved identification. There is also capacity to add new information fields as required.

Nutritional status

Biological markers of nutritional status include blood pressure, anthropometric, and biochemical measurements, each of which forms an essential component of general nutritional status assessment. The most common anthropometric measurements are weight and changes in weight, stature, segmental lengths, fat folds, and various body circumferences and diameters. Along with demographic data, these provide for additional measures such as weight for height, weight for age and height for age which are crucial indicators of failure to thrive.

Infant and child growth assessment

Since 1987, information has been gathered by Aboriginal health workers and clinic-based nurses in the region on the weights and heights of children under 5 years of age. These data have been compiled for each community as a 'Ten Year Growth Story 1987–1997' and the results for Wugularr have been obtained. These show that babies grow well on average until the age of 5 months after which time most have problems with growth typically for the next four years. The transition coincides with the period of weaning from breast milk to solid foods. Apart from this finding, it is difficult to establish trends in the available data. Not all children were measured each year, with the numbers varying from a low of 27 in 1987 to a high of 72 in 1992. Nor do the data reflect true cohort flows as the individuals counted may well differ from year to year.

Table 7.1 Ten Year Growth Story for children under 5 years old: Wugularr, 1987–97

Year	% of those measured			
	Stunted	Wasting	Underweight	Not growing well
1987	52	9	48	63
1988	50	10	43	57
1989	no data	no data	no data	no data
1990	no data	no data	no data	no data
1991	42	18	50	60
1992	40	8	33	50
1993	22	6	22	32
1994	20	7	19	32
1995	36	12	18	41
1996	17	10	22	32
1997	15	20	29	34

Source: Wugularr Clinic.

Despite these methodological problems, it is worth analysing some of these data if only to display the variability of results as well as to draw comparison with similar data for the rest of the Katherine Health District and Australia as a whole. Table 7.1 shows the percentage of those measured in each year who were considered to be below average height (stunted) for their age and underweight for their height (wasting). These measures of

weight and height gain are a standard public health measure of poor nutrition and also yield estimates of underweight (for age) children and children not growing well (below average weight for age).

It is tempting to suggest that the percentage of stunted children shows a clear decline over time and that generally all indicators trend in a favourable direction. However, such conclusions are unsafe given the methodological flaws in the data. What emerges clearly, though, is a generalised low nutritional status. For example, taking an average of the results from each year for those not growing well, the proportion observed at Wugularr (44%) is somewhat above the average for Katherine District using similar results (35%), but markedly in excess of the proportion recorded for all children in Australia (around 3%). Measurement difficulties notwithstanding, this provides a fairly stark indication of the severity of nutritional problems among children in the region.

Table 7.2 THS growth monitoring schedule

Age at monitoring	Weight	Length	Height	Head circumference	Haemoglobin
At birth	✓			✓	
Birth–8 weeks	every 2 weeks				
6–8 weeks (post-natal check)	✓	✓		✓	
2–6 months	every month				
6 months	✓	✓		✓	✓
6–12 months	every month	every 6 months			every 6 months
1–2 years	every month	every 6 months			every 6 months
2–3 years	every month		every 6 months		every 6 months
3–4 years	every 6 months		every 6 months		every 6 months
4–5 years (at school entry)	✓		✓		✓
At 10 years	✓		✓		✓
At 15 years	✓		✓		✓

Source: THS, Darwin.

Efforts are under way to improve the quality and coverage of growth assessment data. The Growth Assessment Action Program administered under the Food and Nutrition Unit of THS includes a growth monitoring schedule aimed at assessing the growth of all children under the age of 15 years by standard anthropometric and haematological measurement. As with the under-fives' weight and height data collected to date, information is held purely for internal THS evaluative purposes as part of the establishment phase of the program aimed at developing an information flow. The main methodological problem continues to relate to the gaps in coverage as well as change over time in those individuals screened. Ultimately, the goal is to establish a regular screening schedule for all children aged under 15 years of age. Details of this schedule are set out in Table 7.2. In theory, with

time, these data would be available on a cohort basis thus enabling the identification of trends in child growth status. Given the importance of such anthropometric data in the surveillance of nutritional status, successful application of this program in the Katherine East region would be a vital adjunct to the more practical interventions that are seen as being the central focus of the Nyirranggulung Nutrition Strategy.

Biochemical indicators

A range of biochemical measurements are available to assess the concentration of essential nutrients in body fluids—usually blood and urine—which provide indicators of the nutrition of cells and tissue stores of nutrients. These can be obtained in a structured way by screening sections of the population. A full list of haematological, metabolic, and vitamin data that can be generated from such an approach are noted in the Minjilang nutrition study (Lee 1993; Lee, Bailey et al. 1994). The list includes serum cholesterol, fast serum triglyceride, fasting serum insulin, fasting plasma glucose, haemoglobin, red blood cell folate, serum folate, serum thiamin, serum vitamin B-6, serum vitamin B-12, plasma vitamin C, plasma retinol and plasma carotene. However, pathology is costly. Over the 12-month period of the Minjilang study (which involved around 68 participants), total costs were \$65,000 (at 1990 prices) and a large share of this cost was expended on evaluation, particularly on the assessment of biological indices (Lee, Bailey et al. 1994: 285). It is not clear whether personnel costs are included in the total.

This raises the question of whether such screening and health evaluation techniques are a high priority for the Nyirranggulung Nutrition Strategy, especially given its focus on measuring the implementation of practical interventions that are known to make a difference. Monitoring and indentifying shifts in health indicators is important, but in many cases change is only detectable over the long-term. In any event, THS protocols are already in place for child and adult screening to establish such biochemical indicators, although presently this is only done systematically for children under 5 years of age. Other screening is opportunistic, as individuals access the health system.

In April and October 1999 testing for haemoglobin levels was conducted on all children under 5 years of age in Wugularr. At the April screening, 43 per cent were found to be anaemic, while at the October screening this proportion had increased to 57 per cent. According to clinic staff, hookworm is one source of anaemia, and this is treated by deworming and the administration of iron supplements. As other studies have shown (Fraser 1996; Kruske et al. 1999), this sort of intervention can assist in improving haematological status. However, the main source of anaemia—and the focus of any long-term solution as opposed to short-term band-aid intervention—is to be found in poor nutrition and its antecedents, such as the fact that many children essentially eat from the store and much of what they eat is take-away food in its many guises. Underlying this practise are the many diversions from regular and planned eating habits including the influence of parents' gambling and drinking habits as well as their inability to make bulk purchases or to cover the cost of fortnightly domestic food requirements.

Hospital separations data

Hospital separations data are derived from in-patient admission and discharge records, and may be obtained from THS. To assess the nature of these data and their scope for describing health status, figures indicating the number of hospital separations between 30 June 1996 and 30 June 1999 by sex and age were acquired for the Aboriginal population of Barunga, Manyallaluk and Wugularr.

Also obtained were reasons for hospitalisation, coded using the WHO method of disease classification which follows the 9th revision of the International Classification of Diseases (ICD9). Briefly, this consists of 17 primary categories of disease plus two supplementary classifications dealing with external causes of injury and poisoning, and contact with health workers.

Over the three years from June 1996 to June 1999, a total of 875 admissions of Aboriginal people from the three Katherine East communities were made to Northern Territory hospitals. The vast majority of admissions were made to Katherine Hospital (84%) with most of the rest (15%) to Royal Darwin Hospital and a handful to Gove. It is important to note that the number of hospital admissions far exceeds the number of individuals admitted: many people are admitted on more than one occasion, although not necessarily always for the same reason. The basic facts are set out in Table 7.3, for male and female admissions.

Table 7.3 Ratio of separations to patients: Barunga, Manyallaluk, and Wugularr, 1996–99

	Separations (1)	Individuals (2)	Ratio (1/2)
Males	373	211	1.8
Females	502	231	2.2
Total	875	442	2.0

Source: THS, Darwin.

Data for the past several years are of interest in capturing the range and variety of causes of hospitalisation, but in order to calculate rates it is necessary to reduce the analysis to a single year, against a base population with some claims to reliability. The only population data available to the project that approached this requirement (in being an estimate of the usually resident Aboriginal population, with the added advantage of being derived from THS records of usual place of residence and therefore from a similar source as the hospitalisation data), were those for the client base of Wugularr clinic as at April 1999 (as discussed in Ch. 2). From this source, a population of 416 persons is assumed for Wugularr. During 1999, a total of 88 individuals who indicated Wugularr as their usual place of residence were hospitalised. This represents 21 per cent of the estimated population.

It is interesting to note that this rate is substantially above the 9.2 per cent of individuals in Garrak–Jarru ATSI region who reported going away for the treatment of a health problem in the 12 months prior to the 1994 NATSIS (ABS 1996b: 18). Admittedly, this was

based on a sample survey which included residents of Katherine. However, THS publishes a crude rate of separations, using all separations as the numerator (excluding those for renal dialysis). On this basis the crude separation rate for Aboriginal people in Territory Health's Northern Region in 1997 was calculated at 26.5 per cent (Moo et al. 1998: Attachment A) which seems to place some credibility on the estimated rate for Wugularr. Assuming that reliable age and sex data can also be obtained from the clinic demographic data, age and sex-specific hospitalisation rates could also be derived to establish the pattern of major morbidity over the life course.

Table 7.4 Hospital admissions among Aboriginal residents of Barunga, Manyallaluk, and Wugularr by ICD9 primary category, 1996–99

ICD category	Females		Males	
	No.	%	No.	%
1	25	5.0	26	7.0
2	9	1.8	4	1.1
3	26	5.2	21	5.6
4	7	1.4	13	3.5
5	2	0.4	0	0.0
6	23	4.6	9	2.4
7	23	4.6	18	4.8
8	50	10.0	59	15.8
9	21	4.2	27	7.2
10	37	4.7	14	3.7
11	105	20.9	0	0.0
12	28	5.6	20	5.4
13	10	2.0	7	1.9
14	0	0.0	4	1.0
15	9	1.8	11	2.9
16	25	5.0	13	3.5
17	58	11.5	74	19.8
18	44	8.7	53	14.2
Total	502	100.0	373	100.0

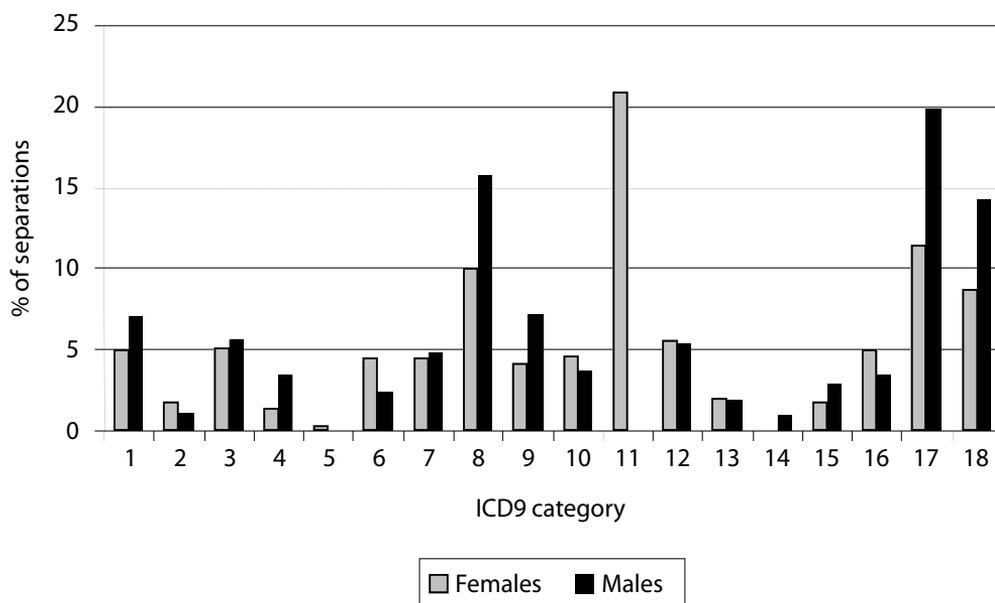
Note: Key to International Classification of Diseases (ICD9) primary categories: 1. Infectious and parasitic diseases; 2. Neoplasms; 3. Endocrine, nutritional and metabolic disease and immunity disorders; 4. Diseases of the blood and blood-forming organs; 5. Mental disorders; 6. Diseases of the nervous system and sense organs; 7. Diseases of the circulatory system; 8. Diseases of the respiratory system; 9. Diseases of the Digestive system; 10. Diseases of the genito-urinary system; 11. Complications of pregnancy and childbirth; 12. Diseases of the skin; 13. Diseases of the musculo-skeletal system; 14. Congenital anomalies; 15. Conditions originating in the perinatal period; 16. Symptoms, signs and ill-defined conditions; 17. Injury and poisoning; 18. Supplementary classification of factors influencing health status and contact with health services (V code).

Source: THS, Darwin.

Causes of hospitalisation

In profiling the nature of morbidity as defined by the disease causes of hospitalisation, data for all separations (including repeat separations) are utilised. This is because individuals can, and often are, admitted to hospital more than once, but for quite different health reasons. Table 7.4 shows the distribution of separations by ICD9 primary category between 1996 and 1999 for males and females from Barunga, Manyallaluk and Wugularr, while Figure 7.1 shows this graphically. Category 18 refers to the ICD9 supplementary classification of factors influencing health status and contact with health services. This is the ICD 'V' code.

Fig. 7.1 Distribution of hospital separations by sex and ICD9 primary category: Aboriginal residents of Barunga, Manyallaluk, and Wugularr, 1996–99



These data should be interpreted with two caveats in mind. First, these are total separations, not person separations. Second, the decision to hospitalise can be subjective and based on different perceptions of the need for hospital care on the part of doctors and health workers. Over the timeframe in question a variety of personnel would have been involved in such decision-making.

The first point to note is the quite distinct differences between male and female causes of hospitalisation. One-fifth of separations among females were related to pregnancy and childbirth, reflecting the long-established practice in the Northern Territory of evacuating women to regional hospitals for childbirth. While many of these confinements lead to normal delivery, almost three-quarters (64%) involve some complication. It should also be noted that for females a proportion of separations under category 18 (factors influencing

contact with health services) includes neo- and post-natal care but this category also includes continuing treatment for a known disease requiring access to hospital facilities, such as dialysis for renal disease, or chemotherapy. Category 17 (injury and poisoning) is the other major cause of hospitalisation that is relatively high among females. It accounted for 11.5 per cent of all female cases over the three-year period. Major causes in this category included treatment for fractures, dislocations, sprains, contusions, and open wounds. Leaving aside uniquely female reasons for hospitalisation, the main differences between males and females are the lower incidence of separations for diseases of the respiratory system and injury and poisoning for women. Although injury and poisoning is a relatively common cause of hospitalisation for women, it is even more common for men, at 19.8 per cent.

Within this overall distribution of disease morbidity, of particular interest is the incidence of separations due to diet-related disease. These can be extracted using three and four digit ICD9 categories according to the list provided in Lester (1994: 223). Table 7.5 shows the number of separations for diet-related diseases for residents of Barunga, Manyallaluk and Wugularr over the seven-year period from June 1992 to June 1999.

Table 7.5 Hospital separations for diet-related diseases: Residents of Barunga, Manyallaluk, and Wugularr, 1992–99

	Barunga	Manyallaluk	Wugularr	Total
Diet-related diseases	99	19	124	242
All diseases	773	127	896	1796
Diet-related as % of total	12.8	15.0	13.8	13.5

Overall, diet-related diseases accounted for 13.5 per cent of all hospital separations during the 1990s. Some variation is apparent between communities but the more striking feature is the broad agreement in the incidences. The main diseases reported include, in descending rank order, diabetes mellitus, intestinal infectious diseases, nutritional deficiencies, ischaemic heart disease, non-infective gastroenteritis and colitis, symptoms concerning nutrition, metabolism and development, and gall-bladder disorders.

Healthy housing and infrastructure

The idea that community housing should be designed, constructed and maintained to support healthy living practices is now firmly embedded in housing and infrastructure policy following the pioneering work of Pholeros, Rainow, and Torzillo (1993) in the Pitjantjatjara Lands of northern South Australia. In their terminology, ‘healthy home hardware’ refers to the provision of adequate facilities to store, prepare, and cook food. It also extends to water quality and quantity as deficiency in either of these may lead individuals to purchase bottled water and other beverages, thereby adding to expenditure and increasing reliance on soft drinks and cordials.

The National Indigenous Housing Guide (Commonwealth of Australia 1999b) includes a range of design and functionality guidelines to address these nutrition-related issues, listed below.

- *Different ways of cooking.* Given the large numbers of people often resident in households and the frequent failure of cooking equipment, it is common for many different age groups to share the cooking facilities of a house. At the same time, each group may have a different preference for cooking. For example, younger people may use a microwave oven; middle-aged people may use a stove or drum oven and barbecue; older people may prefer to cook on a fire on the ground. There is a need, therefore, to consider how many 'kitchens' each house might need.
- *Electric cooking: stoves and hotplates.* Electric hotplate cooking is one of the major sources of energy use in a house. To control costs, stove timer switches can be installed to cut off power after a set period. It has also been found that solid hotplates are more robust than coil elements.
- *Fridges.* Poorly performing fridges can lead to food spoiling and food poisoning as well as to high energy costs. A number of simple directives can be applied to assist in overcoming these problems: for example ensuring that the fridge is located in a thermally efficient area and that door seals are regularly maintained. However, one intractable problem with fridges in overcrowded households is the frequency of use. The only solution here is provision either of more fridges or of lower density housing.
- *Kitchen cleaning and maintenance.* The design and detailed specification of the kitchen area, joinery, and appliances can make cleaning easier by reducing cleaning effort and blocking access for insects and vermin.
- *Food storage.* Low shelves and cupboards are easily accessed by dogs and children or are either unused or used to store non-food items. Consideration should be given to providing high shelves and cupboards and/or lock-up pantries that are insect-proof and well ventilated.

An annual environmental health survey is carried out in each community by officers from the Northern Territory Department of Local Government and THS. This involves an inspection of each dwelling to assess the functionality of structural items, plumbing items, and kitchen items. From this assessment a schedule of maintenance works and repairs is constructed. Results of the 1999 Environmental Health Survey in regard to the functionality of kitchen items at the three communities under study are presented in Table 7.6.

Clearly, the main health hardware concern from a nutrition perspective is the functionality of stoves with 56 dwellings (42% of those inspected) reporting a need for works or repairs. One shortcoming of these summary-type data is their lack of detail regarding the degree of functionality. For example, the 56 dwellings noted above include cases where no stove was available as well as those where only minor repairs were required. Even refining this information would only provide a partial indication of adequacy, as no data are gathered on how many different means of cooking are required or available.

Table 7.6 Number of dwellings requiring maintenance works or repairs for kitchen items, 1999

Dysfunctional kitchen items	Barunga	Manyallaluk	Wugularr
Stoves	22	10	24
Fridges	3	3	1
Storage cupboards	8	5	7
Bench tops	15	5	4
Dwellings inspected (no.)	58	21	54

Source: THS, Katherine.

A further measure of the functionality of housing from a health perspective is provided by estimates made of overcrowding and housing need. The information gathered by the annual environmental health surveys includes an estimate of the population size of each community together with the number of houses of different bedroom size and the number of existing habitable bedrooms available. From these, two key measures are derived: an average occupancy rate to indicate overcrowding and the number of new bedrooms required to alleviate overcrowding (this latter calculation is also translated into a dollar cost). Estimation of the number of new bedrooms required is based on a target occupancy rate of two persons per bedroom.

Table 7.7 shows the results of housing needs assessment for the three localities in Katherine East drawn from the Northern Territory government's CIAS database. As indicated, the two major communities of Barunga and Wugularr display substantial overcrowding as defined by the normative standard of two persons per bedroom. In each of these localities, alleviation of overcrowding would require the construction of at least as many dwellings (or bedrooms) as already exist. By contrast, the situation in Manyallaluk appears very favourable. The required funding to alleviate overcrowding in the region as calculated by the Indigenous Housing Authority of the Northern Territory (IHANT), with input from the Garruk–Jarru ATSIC Regional Council, is substantial (almost \$16m), although this would be a minimum figure as it assumes no further increase in population.

Table 7.7 Housing needs assessment for Barunga, Manyallaluk, and Wugularr, March 2000

	Normal population	Total bedrooms	Occupancy rate	New bedrooms required	Total cost (\$m)
Barunga	570	142	4.0	143	7.15
Manyallaluk	100	60	1.7	0	0.00
Wugularr	600	123	4.9	177	8.85

Source: CIAS, NT Department of Local Government.

It is evident from these data that nutrition policy in the Katherine East region faces the task not only of addressing such micro-management issues as ensuring quality food supplies or influencing change in dietary habits, but also of considering approaches to overcoming generalised underdevelopment. In response to such findings, the concern of population health research regarding Indigenous Australians has been increasingly to explore the arrangements that best integrate health initiatives with local or regional development more generally. At the community level, the focus has been on measuring the effects of improved environmental health infrastructure and identifying institutional impediments to achieving this (Torzillo and Kerr 1991: 337–52). At a more macro level, the consequences of control over health policy and delivery have been explored in the context of Australian federalism and it is to a consideration of these issues that we now turn.

8. Nyirranggulung and emerging models in Aboriginal primary health care

The Australian system of federalism has seen the development of a complex set of servicing arrangements for the delivery of Aboriginal health services, involving Commonwealth, State and Territory health departments and Indigenous community-controlled medical services. There is a systemic and ongoing tension between State-run mainstreaming and federally-funded separatism (Anderson and Sanders 1996; Kunitz and Brady 1995: 554; National Aboriginal Health Strategy Working Party 1989; Saggars and Gray 1991a: 167–97, 1991b: 389–417). It may be asked whether this complexity of arrangements and conflict over control of resources constitute obstacles to better outcomes in Indigenous health (Bartlett and Legge 1994), a question which underscores a political element in influencing health outcomes for Indigenous Australians.

Not surprisingly, options for establishing a regional model of Aboriginal health service delivery in line with the thrust of the Nyirranggulung Health Strategy have formed the focus of discussions between the Jawoyn Association, the Fred Hollows Foundation and Territory Health Services. The development of coordinated care trials (CCTs) in the Katherine West region and in the Tiwi Islands has attracted considerable interest: these are test cases in the push to redirect resources available for the provision of primary health care so that they are under more direct community control. Based on discussions with the manager of the Katherine West Remote Health Board Aboriginal Corporation (KWHB) and other available data on coordinated health trials more generally, the operations of the Katherine West CCT are particularly instructive as a potential model of service delivery in the Katherine East region.

The unforeseen consequences of the changed role of the KWHB are especially instructive. It was originally a purchaser of health services provided by THS but is now itself a direct provider of services through health centres located in five Aboriginal communities. This has created significant problems for KWHB that were not envisaged in the original planning for the trial, and presents a number of lessons for governance structures and service delivery (Westbury and Sanders 2000). Clearly, in planning for the Nyirranggulung Health Strategy, care should be taken to balance the advantages and disadvantages of becoming a direct service provider as opposed to being a purchaser-provider.

Coordinated care trials

In 1996, the Commonwealth and State and Territory governments announced the establishment of a total of 13 CCTs across Australia, of which four were focused on Indigenous communities. CCTs are designed to test whether coordination of health care of people with multiple service needs (where care is accessed through individual care plans, and funds pooled from existing Commonwealth, State, Territory and joint programs) will result in improved individual client health and wellbeing.

In the Northern Territory, two trials are being undertaken: one on the Tiwi Islands and the other in the Katherine West region. Both were recently further extended as a result of the 1999/2000 budget. The basic premise of these trials is that community control (in the form of health boards), with fund pooling and cash-outs from the Medical Benefits Scheme (MBS) and Pharmaceutical Benefits Scheme (PBS), together with care coordination, can lead to improved health services and indirectly to improved health outcomes. Accordingly, as service delivery models they incorporate several features that make them distinct from other non-Indigenous trials. These are discussed in turn below.

Responsibility for allocating health resources within the respective regions has shifted from the government-operated THS to Regional Health Boards. The Tiwi Health Board has responsibility for Bathurst and Melville Islands. The KWHB covers a large remote area stretching westward from Katherine to the West Australian border. KWHB comprises representatives of Aboriginal communities in the area including Lajamanu, Kalkaringi, Dagaragu, Yarralin, Pigeon Hole, Bulla, and Amanbidgi. It also has an advisory committee to the board comprising non-Indigenous representatives from the Northern Territory Cattlemen's Association and the Timber Creek CGC. Funds that would normally have been allocated to the provision of health services in the respective regions by the Northern Territory government have been 'pooled' and provided to the health boards which may, subject to agreed conditions, allocate these monies according to their own priorities.

Both boards receive additional funds from the Health Insurance Commission in the form of MBS and PBS cash-outs. Residents of remote Aboriginal communities rarely receive rebates through either MBS or PBS, for the simple fact that there are very few doctors or pharmacists to generate such rebates and Aboriginal people do not use Medicare cards. This has, in turn, contributed to Indigenous under-utilisation of the Medicare Benefits Scheme. Indigenous Australians use the scheme at only one-quarter of the rate of other Australians, notwithstanding that their health needs are approximately three times higher (Deeble et al. 1998).

This is a major source of inequity in the present system of remote area health care, when compared to funds and services available to the rest of the community. For the purposes of the Aboriginal trials the Commonwealth has agreed to fund a per capita amount (additional to the normal Northern Territory government funding allocation) based on the 'estimated' average MBS/PBS rebate paid to citizens throughout Australia, amounting to approximately \$536 per person per year.

The Indigenous trials are designed to deliver services on a 'whole of population basis', rather than serving the health needs of an identified subset of the community, as applies in the non-Indigenous trials. The rationale for this approach is that it will secure a greater emphasis on preventative, population-based measures than has been possible in the past.

Finally, the trials incorporate the principles of 'care coordination'. Prior to the commencement of the trials, THS facilitated the adoption of a number of best-practice protocols for management of chronic diseases and the development of a new computer-based client record system.

The critical attraction of this scheme for Aboriginal communities is that participating communities are 'cashed out' with an additional payment calculated on gaining normal access to, and equivalent usage of, both the MBS and PBS. In Katherine West alone this represented a net increase of \$1.5m per annum. Judgements about effectiveness of these trials awaits the public release of independent evaluations of the data.

In moving to establish the KWHB, the board adopted a carefully planned and strategic approach towards building constructive links with other 'community' stakeholders across the region, including:

- establishing an elected governing board with numbers of members selected under a per capita formula from individual communities;
- investing heavily in educating Board members to carry out their representative functions effectively (including the use of innovative reporting systems designed for people with low literacy levels);
- initiating dialogue with the Northern and Central Land Councils with a view to securing leases from relevant Land Trusts for KWHB operations;
- securing Memoranda of Understanding with local community councils to ensure regular communication and to clarify respective roles and responsibilities;
- establishing health committees in individual communities that focus solely on health issues; and
- carrying out extensive consultation with non-Indigenous residents of the region living on pastoral properties and small townships, which led to the establishment of a consultative sub-committee representing the Cattlemen's Association and 'town residents' and the agreement of non-Indigenous residents to participate in the trial.

Improvements reported by KWHB in the level of delivery health services since the commencement of the trial include:

- significant increases in the level of staffing of community health centres (including Aboriginal health workers);
- improved provision of mobile primary care services to Aboriginal and non-Aboriginal pastoral properties and outstations;
- a doubling of primary care doctor visits to communities;
- the location, for the first time, of resident general practitioners in Aboriginal communities;
- establishment of women's and aged care programs; and
- increased delivery of dental and specialist services.

Lessons for the Nyirranggulung Health Strategy

Despite these improvements in service delivery, a number of significant issues have emerged as a result of the Katherine West CCT that require careful consideration by organisations such as the Jawoyn Association which are contemplating participation in future trials. The scheme will be expanded to other regions following the allocation of monies by the Commonwealth in the 1999/2000 financial year.

Because of perceived difficulties with the adequacy of the delivery of health services purchased by the KWHB from THS, the KWHB has itself assumed direct responsibility for providing primary health care services in a number of community health centres, thus moving from being a purchaser to a direct provider of health services. The problems reportedly revolved around the difficulties faced by THS in maintaining adequate staffing of remote community health centres and the resultant difficulties in maintaining continuity in service delivery, training, and essential records management, and the high levels of administrative or 'on-costs' charges levied by the Northern Territory government (52% 'on-costs' per purchased position). As a result of this change, KWHB has assumed significant recruitment and ongoing management functions. It has also inherited a historically determined baseline THS funding formula that may not reflect the level of actual needs faced in the region. This has already led to the KWHB experiencing a shortfall in THS funding in operating the community health centres, forcing the Board to dip into the MBS/PBS 'cash-out' monies to meet the difference. This development is completely at odds with the original purpose of these new funds, which were earmarked for new initiatives. Accordingly, the KWHB has also expressed concern that their assumption of direct responsibility for delivering services should not entail a THS 'withdrawal from the region's health delivery landscape'. It argues for the continuing and critical 'safety net' role of THS in the delivery of services in a number of critical areas (KWHB 1999).

The other major concern arises from the current model for cashing out MBS/PBS funds on a capped per-capita basis, based on an average usage by all Australians with average health status. Unresolved issues emerge here on two counts. First, the MBS/PBS equivalent is effectively capped by reference to a per-capita usage figure, while MBS/PBS usage by the rest of the population is not capped. Secondly when the chronic health status of Aboriginal people in the Katherine West region is taken into account, it becomes self-evident that applying Australian averages to the current per-capita adjustment without incorporating morbidity and remoteness multipliers is both inequitable and potentially discriminatory. Estimates of the burden of disease might provide a more appropriate measure.

By contrast, the basis on which the Northern Territory government itself receives Financial Assistance Grants from the Commonwealth is largely determined by relativity adjustments that recognise the increased costs associated with delivering health and other services to Indigenous residents of the Territory. This critical issue was also identified in the recent review of Aboriginal education in the Northern Territory, which highlighted the problems that arise when common funding formulas applied for service delivery in remote areas fail to take into account differing levels of need and the service provision costs in Aboriginal communities (Northern Territory Department of Education 1999). When considered against a backdrop of projections that anticipate a 20 per cent rise in general

hospital admissions among Indigenous residents of the Northern Territory by 2006 (KWHB 1999), and while the incidence of end-stage renal disease is doubling every four years in the Top End (KWHB 1999), the case for focusing on improving community-based care services is compelling on economic grounds alone.

There are, therefore, serious unresolved funding issues that organisations should be aware of and should carefully negotiate to overcome before participating in any future trials. An emerging lesson from the experience of the KWHB is to ensure that funding arrangements are carefully negotiated beforehand, or that specific clauses are included in any agreement to renegotiate funding arrangements within a specified period. This is an essential safeguard, particularly where the sponsoring organisation may contemplate moving from being a purchaser to a provider of services. Another key consideration relates to economies of scale and whether the regional population serviced under the proposed Nyirranggulong Health Authority would be of sufficient size to be viable under the joint funding arrangements of the CCT model.

These problems notwithstanding, the CCTs have highlighted the inequitable position faced by most remote Aboriginal communities. This inequity becomes obvious when their access to funded health services is compared to that of the rest of the population. More positively, however, these trials have provided a significant opportunity for Aboriginal communities to assume community control of health services and, at the same time, demonstrate that they may also be better placed to service non-Indigenous health servicing needs than the usual government provider. In the move to successfully establish the KWHB a number of critical steps were undertaken that should be relevant to other regionally-based organisations, such as the Jawoyn Association, which aim to deliver services to Aboriginal communities in remote areas. They are also particularly relevant to the establishment phase of a food and nutrition project in Katherine East. The steps to consider include:

- a sustained period (six months) of intensive consultation and negotiation with all affected communities and key stakeholders before the establishment of KWHB;
- adoption of a multi-pronged strategy in maintaining ongoing communication with all stakeholders, backed up where relevant by formal agreement (regional service delivery agreements) which clarify respective roles and responsibilities between KWHB and other organisations such as land councils and community councils;
- a strong emphasis on the establishment and support (including training) of the Governing Board;
- a recognition that Aboriginal-controlled health services established in small individual communities outside major urban centres in the Northern Territory are no longer viable as entirely autonomous, stand-alone agencies; that they should be operated on a local level under the umbrella of a regional organisation, with the power to purchase and provide services for Indigenous and non-Indigenous residents;
- that funding arrangements need to be carefully negotiated with governments from the outset, with the inclusion of specific safeguards in agreements to ensure that funding issues are able to be periodically reviewed and renegotiated.

Heads of Agreement

Implementing and sustaining a successful nutrition strategy in Katherine East that has tangible health outcomes for the region's population will be no easy task. It will involve dealing with multi-faceted and complex issues, many of which are interrelated and some of which are unique to particular communities and their representative organisations. It will also require a demonstrable commitment to and meaningful partnership with all relevant stakeholders—this includes not only those initiating this process, but also THS, the Barunga–Manyallaluk and Wugularr CGCs and Barunga and Beswick Progress Associations, as well as the TCU.

An essential first step has already been successfully negotiated. In order to ensure that roles and responsibilities in relation to the Nyirranggulung Nutrition Strategy are clearly defined and understood, a Heads of Agreement was signed between the Jawoyn Association and the Fred Hollows Foundation in May 2000. This agreement outlines the objectives, principles, protocols, and key strategies for the project, each underpinned by a series of action plans defining roles and responsibilities (who will do what) and timeframes (when it will be done). Above all, the indicators adopted to measure progress emphasise a staged approach to plan implementation, with a focus on practical outcomes rather than the generation of yet more research. The stated intent to systematically fix the things that are known to make a difference in terms of raising nutritional status is a response to a real issue in the Katherine East region: Aboriginal people perceive that they have been over-researched with no obvious return or benefit to the communities involved.

Initially, practical progress has involved the appointment and placement of a qualified nutritionist–community development worker to raise community consciousness and participation in the Nyirranggulung Nutrition Strategy, and a focus on supporting existing initiatives such as those adopted by the stores and the women's centres. Agreement has also been reached to commence an independent and comprehensive report into the financial and management status of community stores and their future requirements and operations. While the terms of reference for this report are yet to be decided, this are likely to include:

- the current legal status of ownership and management;
- the current financial and trading position;
- the nature and cost of any necessary infrastructure upgrade, including refrigeration, storage, food preparation areas, and scanning technology;
- the options for joint regional transport and wholesale arrangements;
- future managerial, recruitment, training, and employment strategies;
- requirements for independent financial monitoring and reporting;
- means to adopt best practise in the handling, storage, and display of dry goods and fresh produce;

- means to improve and establish more regular monitoring and reporting of store food prices;
- measures necessary for the adoption of best practice food policies; and
- options for the development of commercially sound business plans.

Over the medium term, further indicators of progress in planned intervention will focus on:

- the implementation of findings from the review of store management and finances;
- increases in the store turnover of healthy foods;
- lower prices for healthy foods;
- tangible support for existing community-based nutrition initiatives such as school lunches and meals on wheels;
- a review aimed at raising the awareness of nutrition issues as part of the school curriculum;
- the development and endorsement of clearly-defined healthy store food policies;
- the provision, adoption, and utilisation of electronic banking services in communities;
- the provision of financial counselling and budgeting services; and
- measurable improvements in functional home hardware to facilitate the storage, preparation, and cooking of food.

The timing of these activities in Katherine East is fortuitous given the parallel formation of the National Nutrition Policy 2000–10 developed jointly by the Commonwealth, States and Territories. This contains a specific Indigenous policy with action plans to improve the nutrition of Indigenous Australians over the next ten-year period. Much of what the Jawoyn and the Fred Hollows Foundation are attempting to deliver is consistent with these national strategies and the best practices identified therein. The strategy also takes into account, particularly in regard to CCTs, the new directions emerging in the delivery of primary and public health care to Indigenous communities.

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It has long been recognised that poor diet and nutritional status are strongly associated with a variety of chronic, preventable, and non-communicable diseases that are highly prevalent in Aboriginal communities. Not surprisingly, public health programs targeted at improving health outcomes among Aboriginal people increasingly identify improved nutrition as an essential focus of intervention.

In supporting the development of the Jawoyn Association's Nyirranggulung Health Strategy, the Fred Hollows Foundation commissioned CAEPR to research, as a 'scoping exercise', the structural elements that currently impede better nutrition in the communities of the Katherine East region of the Northern Territory, and to examine the current capacity to measure and monitor health impacts that might arise as the result of intervention. This monograph reports on the results.

The analysis reveals that it is not for want of public health research that Aboriginal communities continue to suffer poor nutritional status. Rather, we lack models for the practical application of research findings and for emphasising the interrelatedness of the contributory factors. Among those considered here are supply-side issues including transportation, store infrastructure and management, store food policies, and food prices; and demand-side issues such as employment and income status, educational policies, household expenditure, and capacity to manage household finances.